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PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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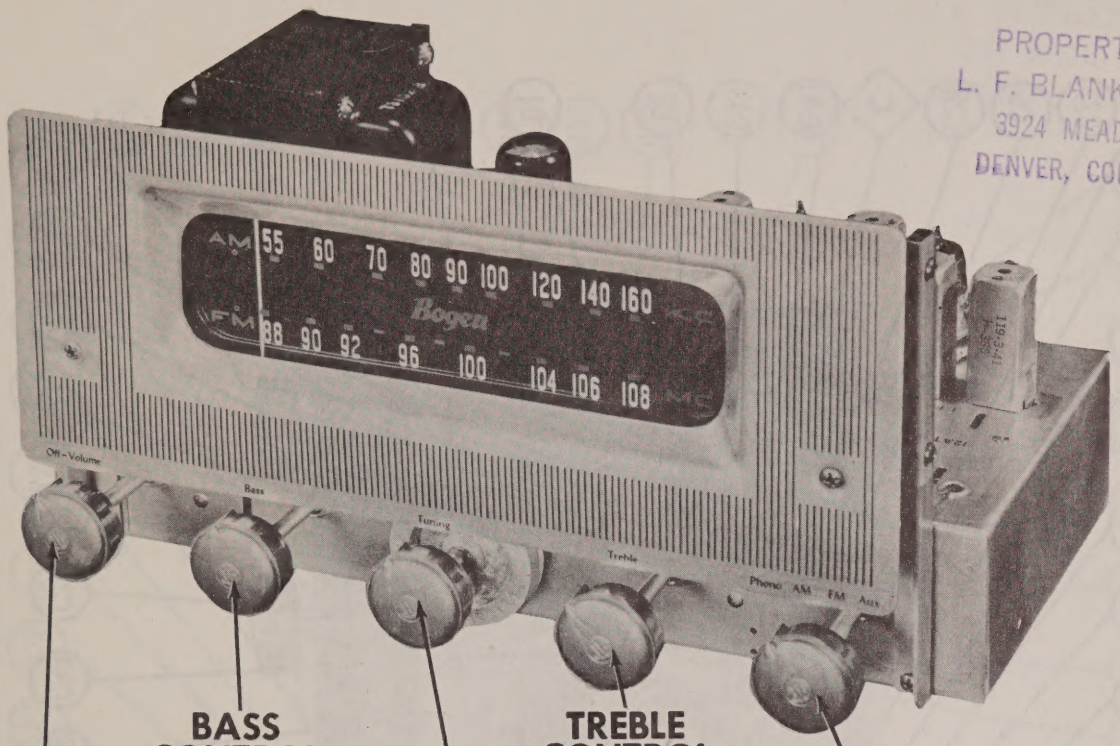
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DAVID BOGEN
MODEL RR500



BASS CONTROL

TREBLE CONTROL

VOLUME CONTROL ON-OFF SWITCH

TUNING CONTROL

FUNCTION SELECTOR SWITCH

DAVID BOGEN
MODEL RR500

TRADE NAME	David Bogen Model RR500	
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York, N.Y.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner for Custom Installations	
TUBES	Eleven	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .86 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	530-1650KC	FREQ.MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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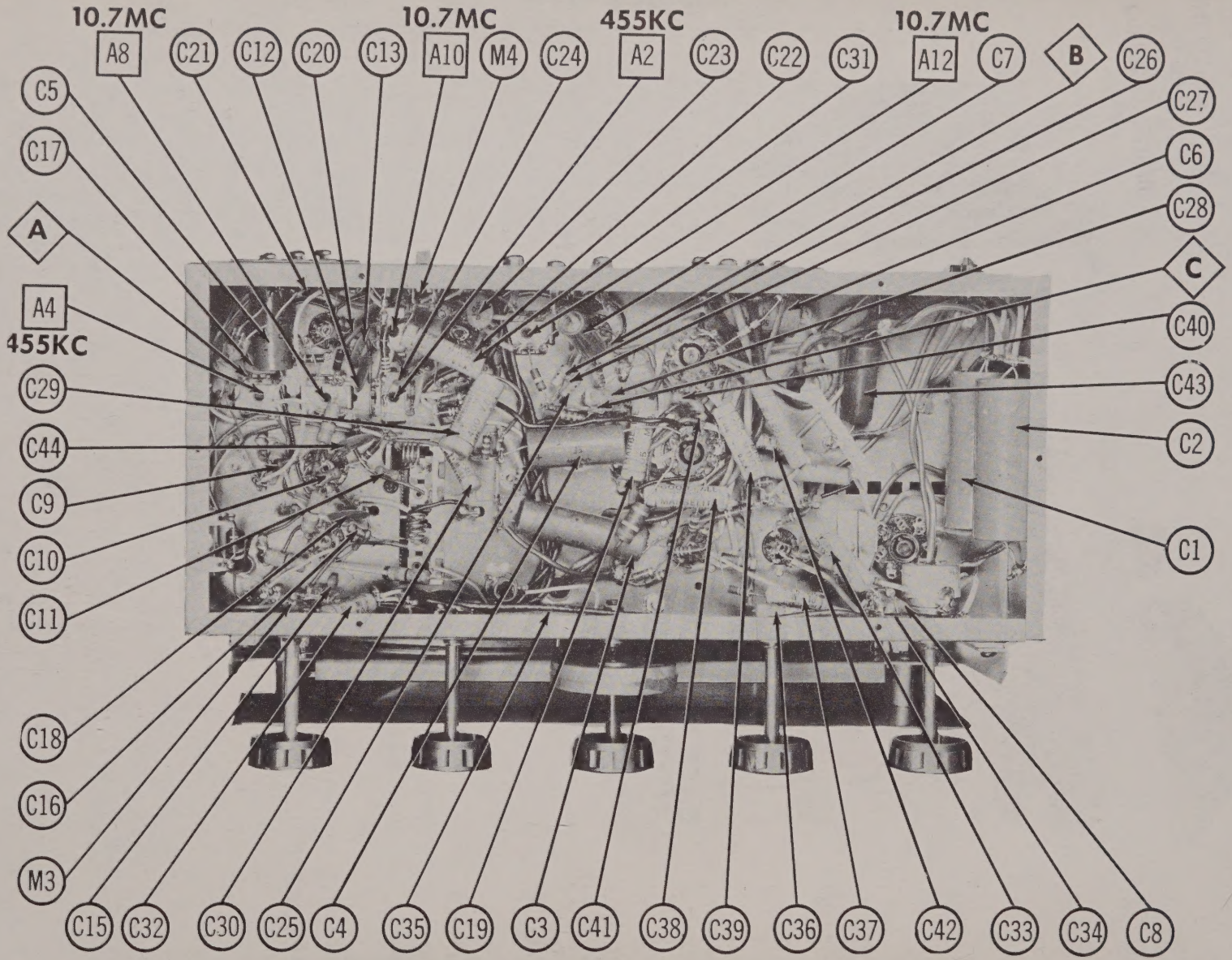
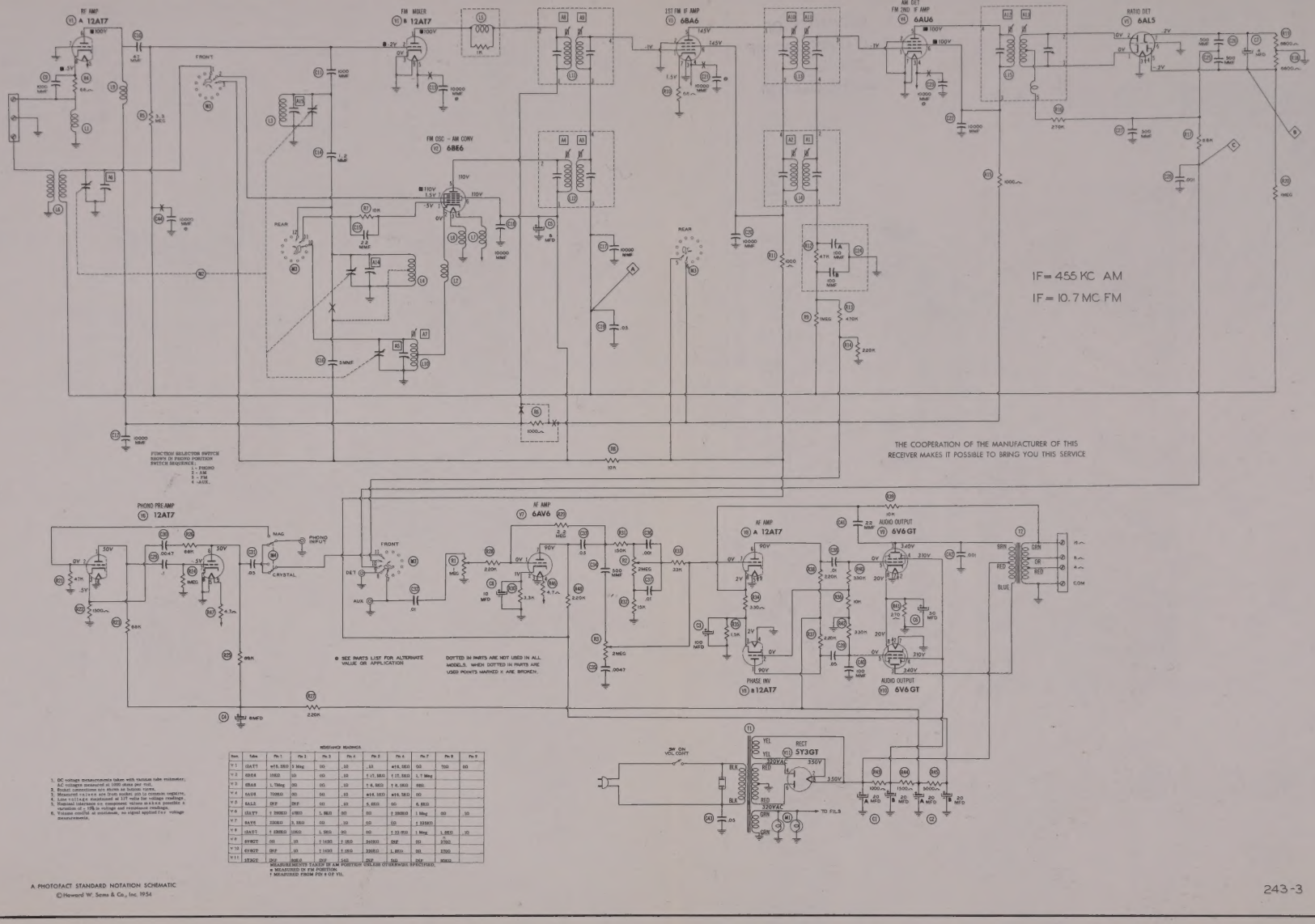


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	∞1.5 MEG	0 Meg	0Ω	.1Ω	.1Ω	∞1.5 MEG	0Ω	75Ω	0Ω
V 2	6BE6	180Ω	1Ω	0Ω	1Ω	1.25 MEG	1.25 MEG	1.1 Meg		
V 3	6BA6	1.1Meg	0Ω	0Ω	1Ω	1 K MEG	1 K MEG	68Ω		
V 4	6AU6	750KΩ	0Ω	0Ω	1Ω	∞1.5 MEG	∞1.5 MEG	0Ω		
V 5	6AL5	INF	INF	0Ω	1Ω	5.6KΩ	0Ω	5.6KΩ		
V 6	12AT7	1 350KΩ	47KΩ	1.5KΩ	0Ω	0Ω	2 350KΩ	1 Meg	0Ω	1Ω
V 7	6AV6	330KΩ	1.5KΩ	0Ω	.1Ω	0Ω	0Ω	2 330KΩ		
V 8	12AT7	1 350KΩ	10KΩ	1.5KΩ	0Ω	0Ω	2 33 KΩ	1 Meg	1.5KΩ	1Ω
V 9	6V6GT	0Ω	1Ω	1 345Ω	2 18Ω	260Ω	INF.	0Ω	370Ω	
V 10	6V6GT	INF	1Ω	1 345Ω	2 18Ω	330Ω	1.8KΩ	0Ω	370Ω	
V 11	5Y3GT	INF	80KΩ	INF	14Ω	INF	INF	INF	80KΩ	

MEASUREMENTS TAKEN IN AM POSITION UNLESS OTHERWISE SPECIFIED.
* MEASURED IN FM POSITION.
† MEASURED FROM PIN 8 OF V1.

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Resistance measurements are taken to ground.
3. Measurements are made with power line at 117 volts.
4. Line voltage maintained at 117 volts for voltage readings.
5. Normal tolerance on component values is ±5% unless otherwise specified. Variation of ± 10% in voltage and resistance readings.
6. Volume control at minimum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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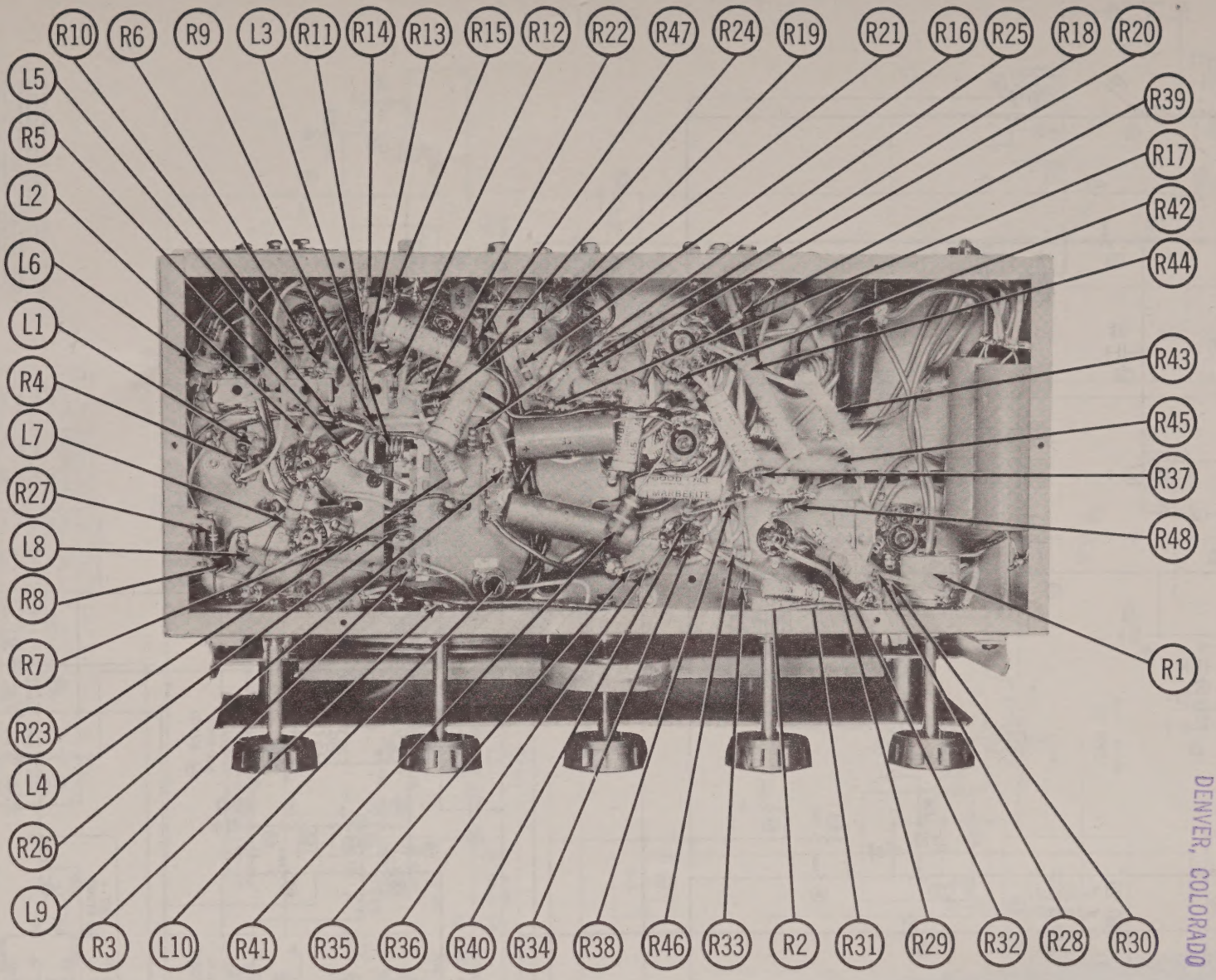


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DAVID BOGEN
MODEL RR500

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (Unmod)	AM	1600KC	Use VTVM. DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	200MMF	High side to AM antenna terminal. Low side to chassis.	1600KC	"	1600KC	"	A5, A6	"
3.	"	"	600KC	"	600KC	"	A7	Adjust for maximum deflection while rocking tuning gang thru 600KC signal.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use 100KΩ resistor in series with DC probe of VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	Use VTVM. DC probe to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 4 and 5 until no further improvement is noted.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizing capacitor C7. Adjust C7. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A13	Reconnect stabilizing capacitor C7. Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	300Ω Carbon Resistor	High side thru 300Ω to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe thru 100KΩ to point Ⓑ. Low side to chassis.	A14, A15	Adjust for maximum deflection. Check tracking at 90MC. If necessary, repeat step 6.

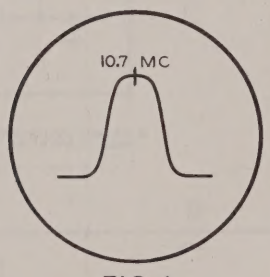


FIG. 1

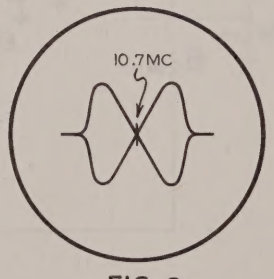


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		David Bogen PART No.	STANDARD REPLACEMENT		
V1	FM RF Amp. - FM Mixer	12AT7	12AT7	9A	
V2	AM Conv. -FM Oscillator	6BE6	6BE6	7CH	
V3	AM-FM IF Amp.	6BA6	6BA6	7BK	
V4	2nd FM IF Amp. - AM Det.	6AU6	6AU6	7BK	
V5	Ratio Detector	6AL5	6AL5	6BT	
V6	Phono Pre-Amp.	12AT7	12AT7	9A	
V7	AF Amp.	6AV6	6AV6	7BT	
V8	AF Amp. -Phase Inverter	12AT7	12AT7	9A	
V9	Audio Output	6V6GT	6V6GT	7S	
V10	Audio Output	6V6GT	6V6GT	7S	
V11	Rectifier	5Y3GT	5Y3GT	5T	

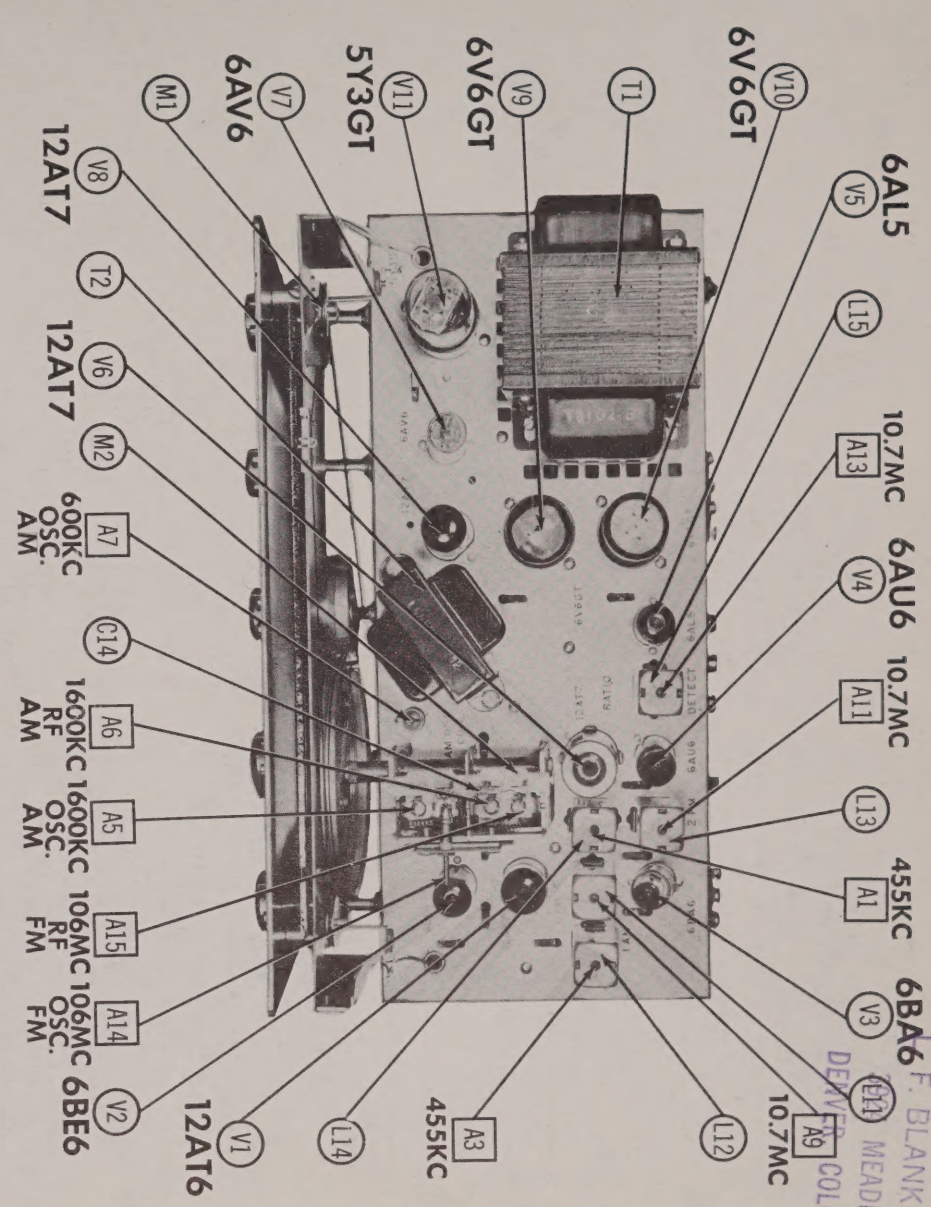
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	20	350		PRS450/20-20		BBRD2245		TCD65	TVA-2730	
B	20	350								
C2A	20	350		PRS450/20-20		BBRD2245		TCD65	TVA-2730	
B	20	350								
C3	100	25		PRS25/100		BRH251		TC2501	TVA-1207	
C4	8	250		PRS250/8		BR825		TC51	TVA-1503	
C5	8	250		PRS250/8		BR825		TC51	TVA-1503	
C6	50	50		PRS50/50		BR505		TC39	TVA-1308	
C7	4	15		PRS150/4		BR550		TC30	TVA-1203	
C8	10	25		PRS25/25		BR102		TC22	TVA-1204	
C9	1000			SI1000	D6-102	TP52	GP2K-102	DC-521	5HK-D1	
C10	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C11	1000			SI1000	D6-102	TP52	GP2K-102	DC-521	5HK-D1	
C12	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C13	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C14	1.2									
C15	22			SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C16	5			SI5	D6-050	TP06	GP1K-050	ZT-555	5GA-V5	
C17	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C18	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C19	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C20	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C21	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C22	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C23	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C24A	100			*PA-97	*PC-50	*111TM1	*1403-01	DC-531	*100C1	
B	100							DC-531		
C25	500			SI500	D6-501	TP47	GP1K-501	UC-535	5GA-T5	
C26	500			SI500	D6-501	TP47	GP1K-501	UC-535	5GA-T5	
C27	500			SI500	D6-501	TP47	GP1K-501	UC-535	5GA-T5	
C28	.001	400		P488-001	D6-102	CUB4D1	GP2K-102	PT421	4TM-D1	
C29	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C30	.0047	200		P288-0047	D6-472	PT2D47	GP2-333-472	PT4247	2TM-D47	
C31	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C32	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C33	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C34	500			SI500	D6-501	TP47	GP1K-501	UC-535	5GA-T5	
C35	.0047	200		P288-0047	D6-472	PJ2D47	GP2-333-472	PT4247	2TM-D47	
C36	.001	600		P688-001	D6-102	CUB6D1	GP2K-102	PT621	6TM-D1	
C37	.01	200		P288-01	D6-103	PJ2S1	GP2-333-103	PT411	2TM-S1	
C38	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C39	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C40	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C41	22			SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C42	.001	600		P688-001	D6-102	CUB6D1	GP1K-102	PT621	6TM-D1	
C43	.05	600		689ZX-05		PJ6S5		PT615	6TM-S5	
C44	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	Note 1

* Items C24A, C24B and R12 are combined in one unit.
Note 1. Not used in all Models.

CHASSIS—TOP VIEW



PROPERTY OF F. BLANKENSHIP 2 MEADE ST. DENVER COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	V320A	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	2 Meg	½	V319A	Q11-139	AG-83-S	B-75	U-56	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	2 Meg	½	V319A	Q11-139	AG-83-S	B-75	U-56	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R4	68Ω	½		BTS-68	
R5	3. 3Meg	½		BTS-3. 3Meg	
R6	1000Ω	½		BTS-1000	
R7	10KΩ	½		BTS-10K	
R8	10KΩ	2		BTB-10K	
R9	1 Meg	½		BTS-1 Meg	
R10	68Ω	½		BTS-68	
R11	1000Ω	½		BTS-1000	
R12	47KΩ	½	*	BTS-47K	
R13	470KΩ	½		BTS-470K	
R14	220KΩ	½		BTS-220K	
R15	1000Ω	½		BTS-1000	
R16	270Ω	½		BTS-270	
R17	68KΩ	½		BTS-68K	
R18	6800Ω	½		BTS-6800	
R19	6800Ω	½		BTS-6800	
R20	1 Meg	½		BTS-1 Meg	
R21	47KΩ	½		BTS-47K	
R22	1500Ω	½		BTS-1500	
R23	68KΩ	½		BTS-68K	
R24	1 Meg	½		BTS-1 Meg	
R25	68KΩ	½		BTS-68K	
R26	68KΩ	½		BTS-68K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R27	220KΩ	½		BTS-220K	
R28	220KΩ	½		BTS-220K	
R29	2. 2 Meg	½		BTS-2. 2Meg	
R30	3300Ω	½		BTS-3300	
R31	150KΩ	½		BTS-150K	
R32	15KΩ	½		BTS-15K	
R33	33KΩ	½		BTS-33K	
R34	330Ω	½		BTS-330	
R35	1500Ω	½		BTS-1500	
R36	10KΩ	½		BTS-10K	
R37	220KΩ	½		BTS-220K	
R38	220KΩ	½		BTS-220K	
R39	10KΩ	½		BTS-10K	
R40	330KΩ	½		BTS-330K	
R41	270Ω	2			
R42	330K	½		BTS-330K	
R43	1000Ω	7		1 3/4A-1000	
R44	1500Ω	7		1 3/4A-1500	
R45	5000Ω	7		1 3/4A-5000	
R46	4. 7Ω	½			
R47	4. 7Ω	½			
R48	220KΩ	½		BTS-220K	

* Items R12, C24A, C24B are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .86A	650VCT .108ADC	5VAC @ 2A	6. 3VAC @ 3. 7A	T-3102-B	PC-8422 ① ②	P-3169 ① ③④	R-14A ②		

① Drill new mounting holes.
② Tape center tap on 6. 3V winding.
③ Use low voltage taps on Sec. # 1 only.
④ Tape two 5V @ 3A and one 6. 3V @ 8A windings.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	10. KΩ CT	16Ω tap @ 8Ω 4Ω	T-292		A-3027		Z1404 ①		① Drill one new mounting hole.

PARTS LIST & DESCRIPTION (continued)

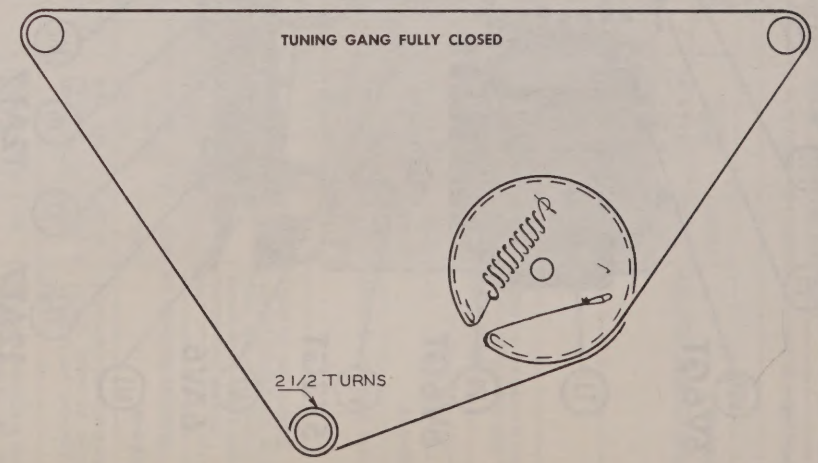
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	David Bogen PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	. 8Ω		U501	19-3001	TV-189	4602	1 Microhenry; IRC Part # CLA
L2	FM RF Choke	. 8Ω		U501	19-3001	TV-189	4602	1 Microhenry; IRC Part # CLA
L3	FM RFCoil	0Ω		U418				
L5	Parasitic Suppressor	0Ω		U505				Wound on 1KΩ resistor
L6	AM Ant. Coil	. 1Ω	1. 8Ω	U306	14-1071	BC-380	70-A	
L7	Fil. Choke	. 8Ω		U501	19-3001	TV-189	4602	1 Microhenry; IRC Part # CLA
L8	Fil. Choke	. 8Ω		U501	19-3001	TV-189	4602	1 Microhenry; IRC Part # CLA
L9	RF Choke	. 8Ω		U501	19-3001	TV-189	4602	1 Microhenry; IRC Part # CLA
L10	AM Osc. Coil	2. 2Ω		U303	14-1060		71-Osc.	Tapped @ . 3Ω
L11	1st FM IF	. 6Ω	. 6Ω	H294	16-3487	FM-254	1463	
L12	1st AM IF	15Ω	15Ω	H-386	16-6758	BC-352	12-C1	
L13	2nd FM IF	. 6Ω	. 6Ω	H-294	16-3487	FM-254	1463	
L14	2nd AM IF	15Ω	15Ω	H-386	16-3487	BC-353	12-C2	
L15	Ratio Detector	1. 5Ω	. 9ΩCT	H-387	17-3488 †	FM-255	1465	Tertiary winding=. 4Ω

† Cut out chassis hole and drill mounting holes.

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M1	Dial light		# 47 bayonet (2 used)
M2	Tuning cap	C-627	4 section AM 17-495MMF & 28-200MMF
M3	Switch	S-387	Function
M4	Switch	S-381	Phono pickup (DPST slide)



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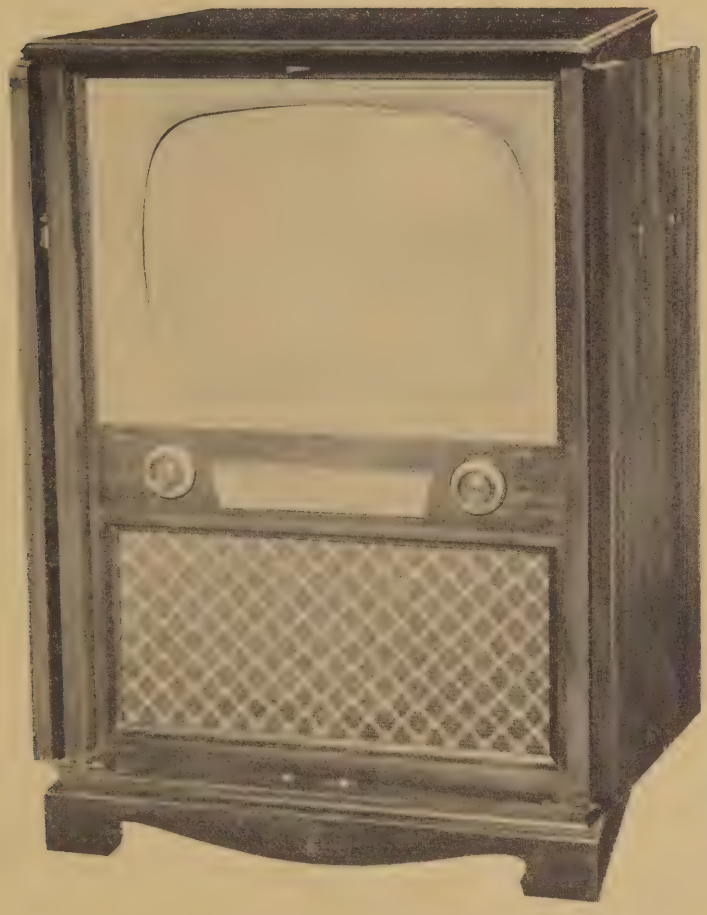

MODEL 771A

EMERSON MODELS 732G, 742E, 752A, B, 753D, F, 755A, B, 760D, H, 761C, 762D, F, 766D, 767A, B, 768A, 770C, 771A, B, D, 772A, 773A, 774A, 775A, B, 784A, 785C, E, 791D, 795C, 799E (Ch. 120174-B, 120180-D, 120184-B, 120185-B, 120190-D, 120191-D, 120192-B, -F, 120193-B, 120198-D, 120209-D, F, 120210-D)

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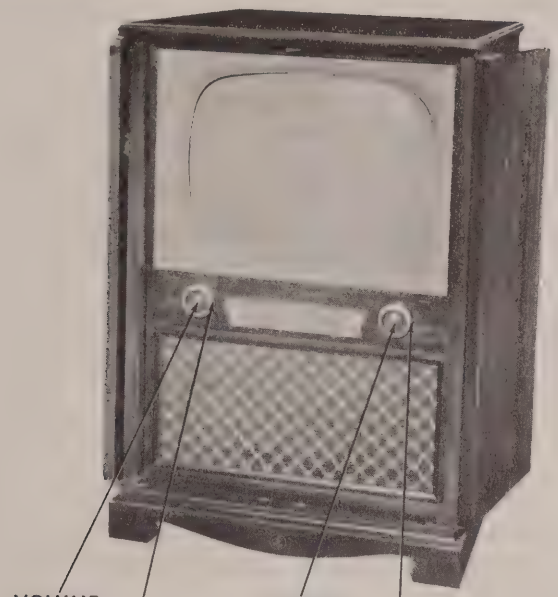

EMERSON MODEL 771A (Ch. 120192-B)

TRADE NAME	Emerson	MODELS	CHASSIS
		752A, 755A, 784A, 752B, 755B	120174-B
		753D, 761C	120180-D
		732G, 742E	120185-B
		760H, 762F	120190-D
		760D, 762D	120191-D
		767A, 767B, 771A, 771B, 773A, 795C	120192-B
		771D	120192-D
		775A, 775B	(TV) 120192-F, (Radio) 120184-B
		768A, 772A, 774A	120193-B
		753F, 785C, 785E	120198-D
		770C	120209-D
		799E	120209-F
		766D, 791D	120210-D
MANUFACTURER	Emerson Radio & Phono Corp., 111 8th. Ave., New York, N.Y.		
TYPE SET	Television Receiver		
TUBES	Twenty-four		
POWER SUPPLY	110-120 Volts AC-60 Cycles		RATING 1.76 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) AM Radio 535-1630KC, AM IF 455KC		

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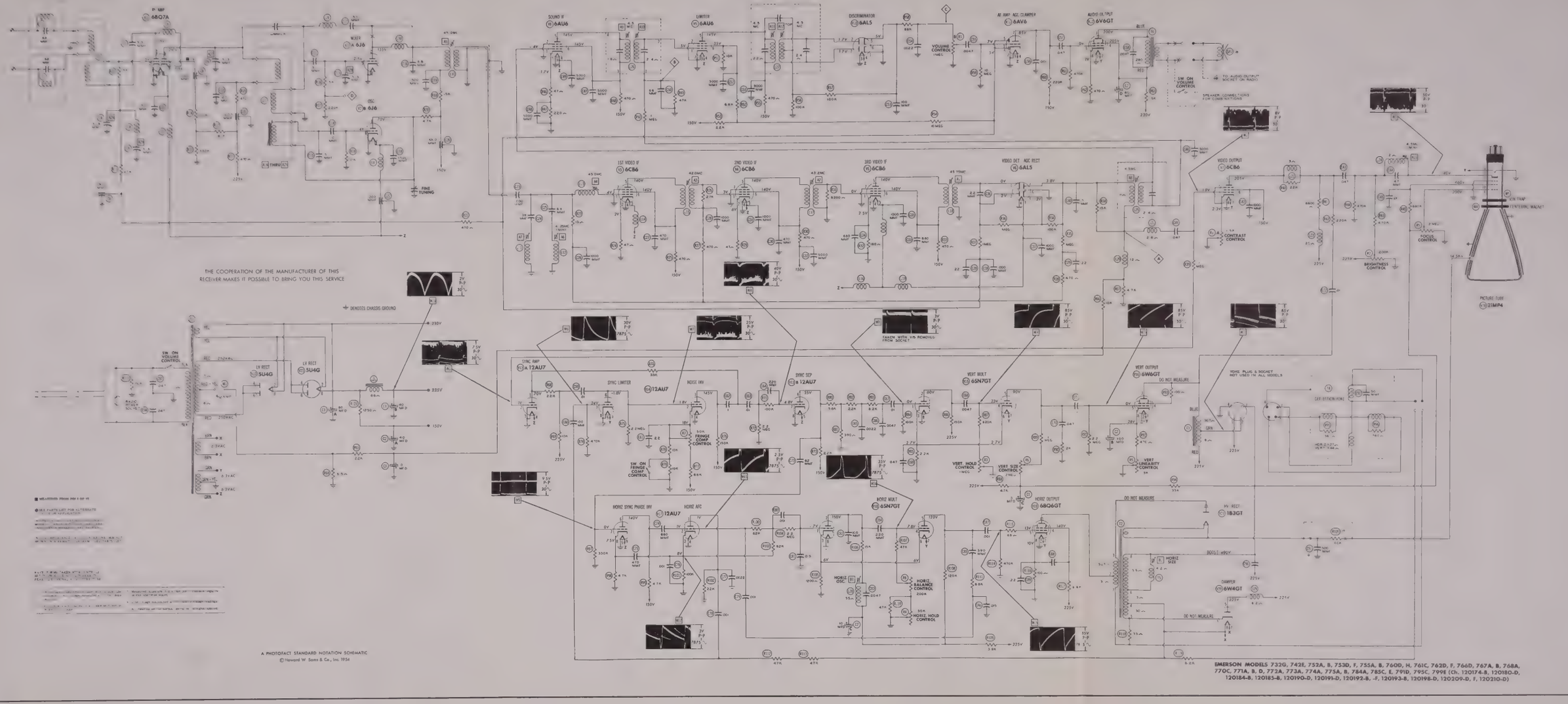
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1954
EMERSON MODELS 732G, 742E, 752A, B, 753D, F, 755A, B, 760D, H, 761C, 762D, F, 766D, 767A, B, 768A, 770C, 771A, B, D, 772A, 773A, 774A, 775A, B, 784A, 785C, E, 791D, 795C, 799E (Ch. 120174-B, 120180-D, 120184-B, 120183-B, 120190-D, 120191-D, 120192-B, -F, 120193-B, 120198-B, 120209-D, F, 120210-D)

EMERSON MODELS 732G, 742E, 752A, B, 753D, F, 755A, B, 760D, H, 761C, 762D, F, 766D, 767A, B, 768A, 770C, 771A, B, D, 772A, 773A, 774A, 775A, B, 784A, 785C, E, 791D, 795C, 799E (Ch. 120174-B, 120180-D, 120184-B, 120185-B, 120190-D, 120191-D, 120192-B, -F, 120193-B, 120198-B, 120209-D, F, 120210-D)

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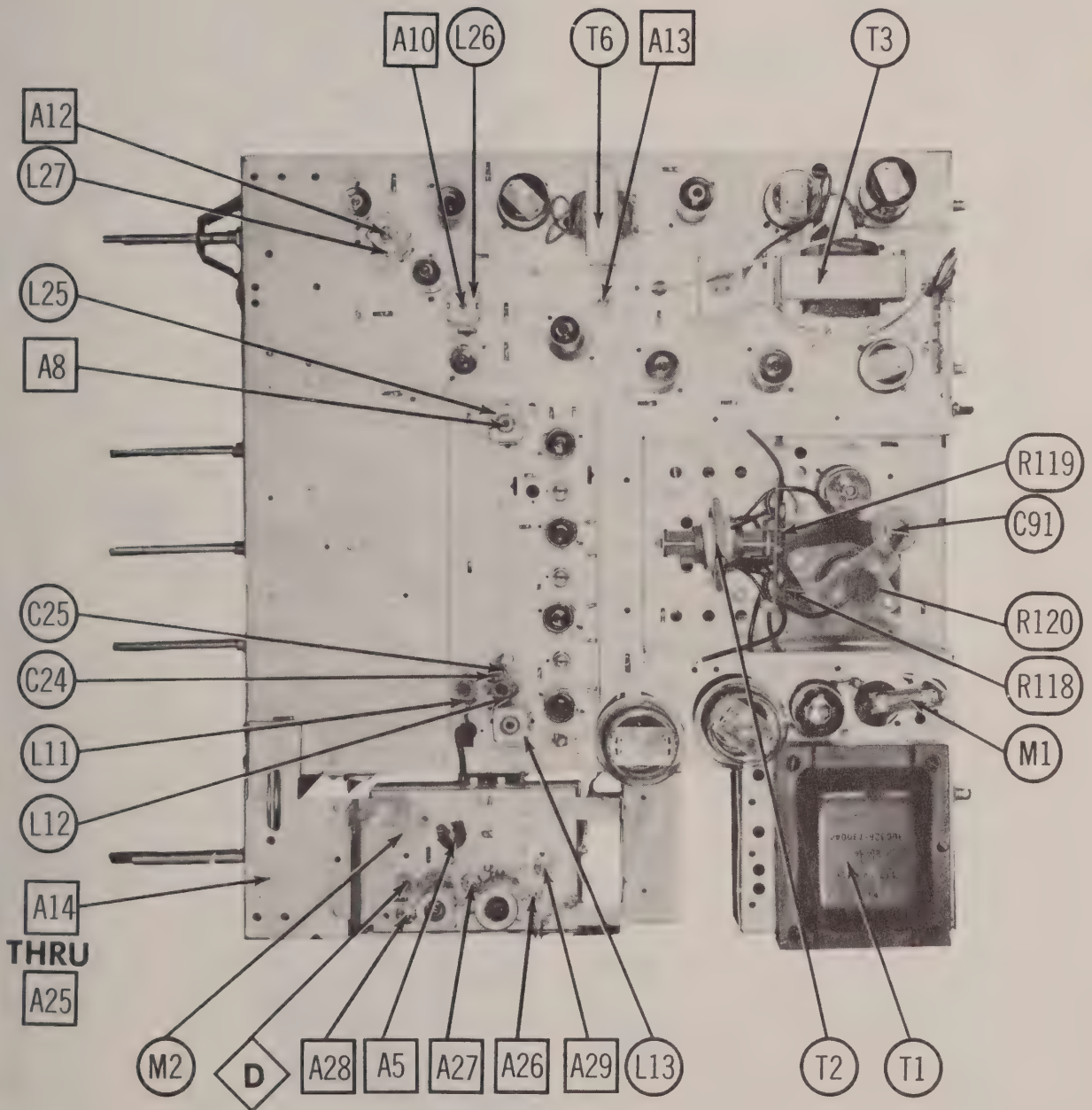
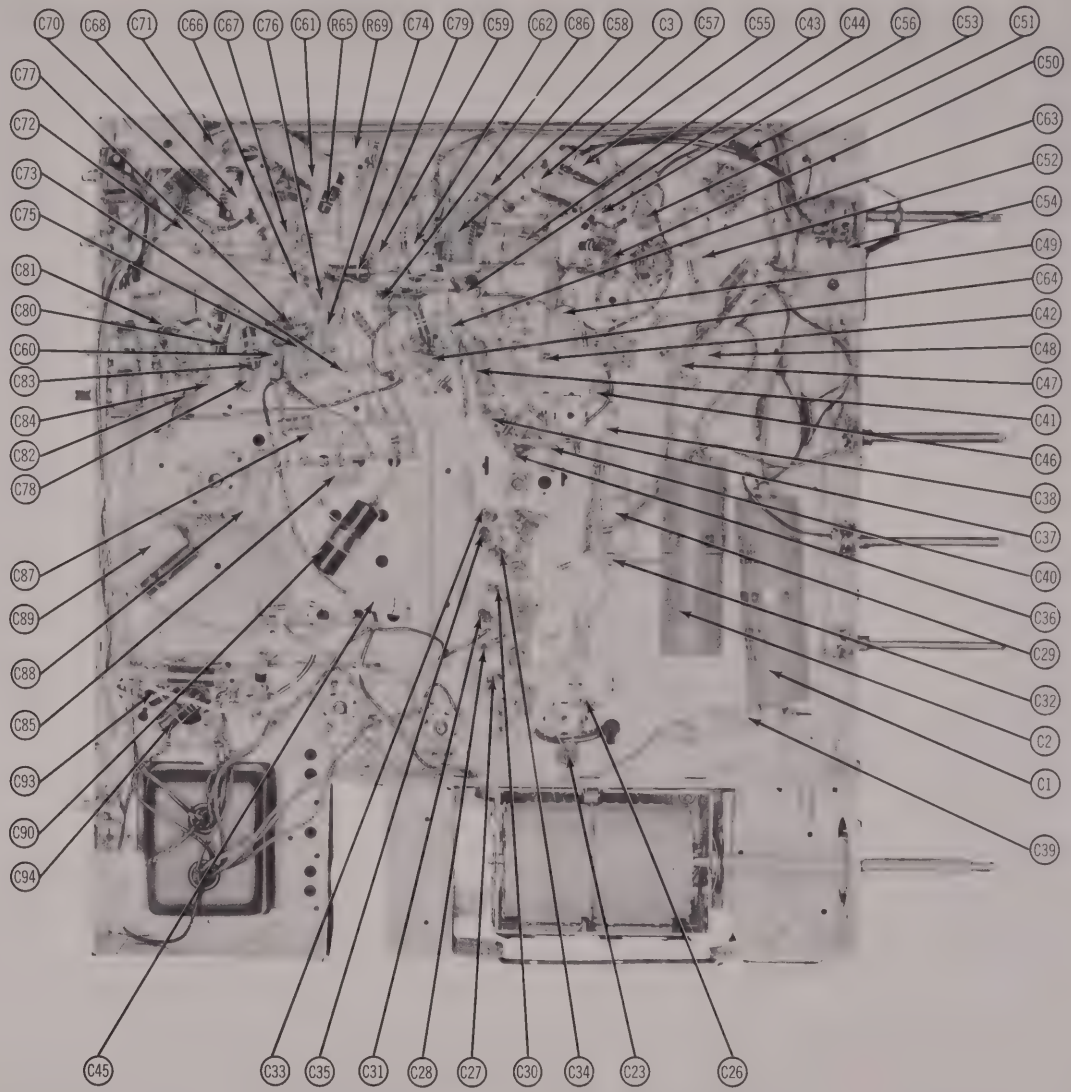


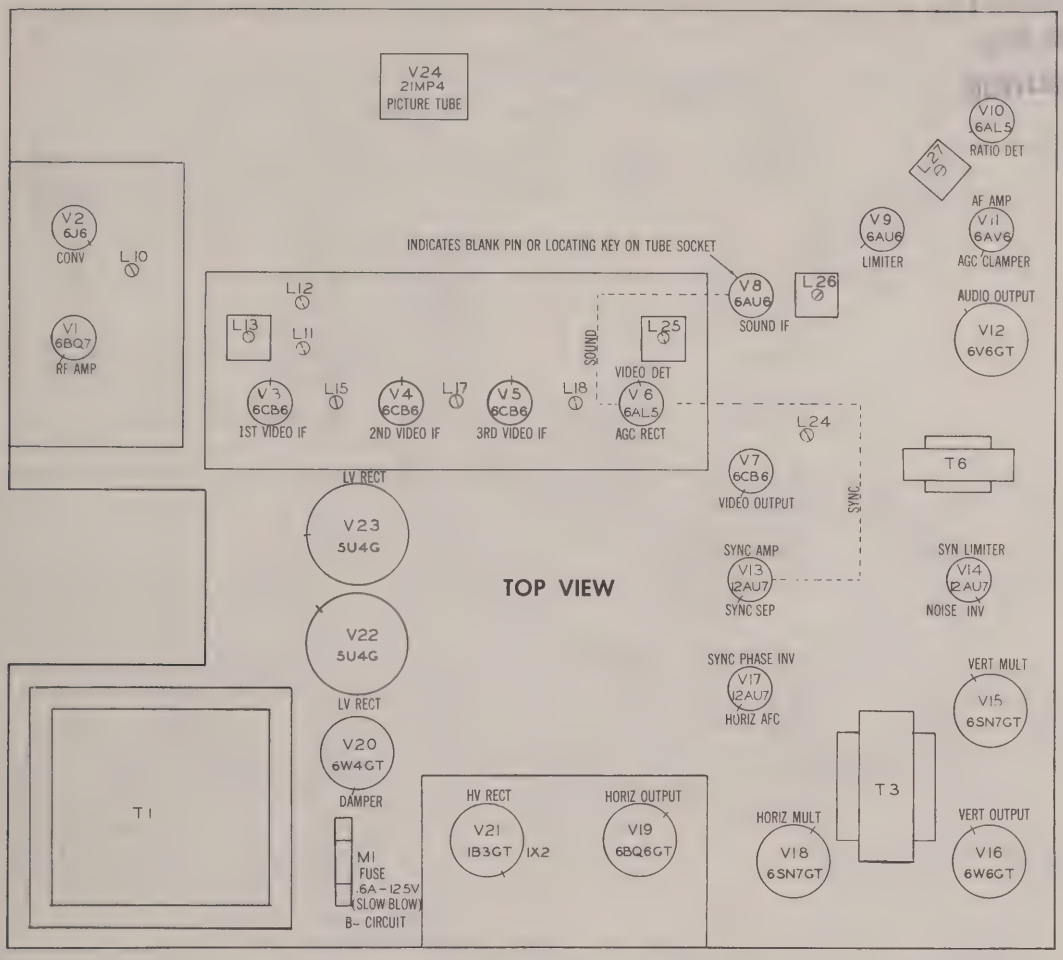
CHASSIS-TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

EMERSON MODELS 732G, 742E, 752A, B, 753D, F, 755A, B, 760D, H, 761C, 762D, F, 766D, 767A, B, 768A, 770C, 771A, B, D, 772A, 773A, 774A, 775A, B, 784A, 785C, E, 791D, 795C, 799E (Ch. 120174-B, 120180-D, 120184-B, 120185-B, 120190-D, 120191-D, 120192-B, -F, 120193-B, 120198-D, 120209-D, F, 120210-D)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, V23, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V24
Has pic, no sound - V8, V9, V10, V11, V12
Overloaded picture -V6, V11

SYNC FAILURE
No vert. sync - V13, V15
No horiz. sync - V13, V17, V18
No vert. or horiz. sync - V13, V14

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V24
No vertical deflection - V15, V16
Poor vert. linearity or foldover - V15, V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22, V23
Vert. off freq. - V13, V15
Horiz. off freq. - V13, V17, V18

EMERSON MODELS 732G, 742E, 752A, B, 753D, F, 755A, B, 760D, H, 761C, 762D, F, 766D, 767A, B, 768A, 770C, 771A, B, D, 772A, 773A, 774A, 775A, B, 784A, 785C, E, 791D, 795C, 799E (Ch. 120174-B, 120180-D, 120184-B, 120185-B, 120190-D, 120191-D, 120192-B, -F, 120193-B, 120198-D, 120209-D, F, 120210-D)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube(V18) from its socket and connect the negative lead of a 6 volt battery to pin 5 (grid) of 6BQ6 (V19). Connect the positive lead to chassis.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C29. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	45.75MC (Unmod)	Any	DC probe to point ⟨A⟩. Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator output to maintain not more than -2 volts at VTVM.
2.	"	"	43.2MC	"	"	A2	"
3.	"	"	42.0MC	"	"	A3	"
4.	"	"	45.0MC	"	"	A4, A5	"
5.	"	"	41.25MC	"	"	A6	Increase generator output. Adjust for MINIMUM deflection.
6.	"	"	47.25MC (400 ∿ mod.)	"	Use scope. Vert. Amp. to point A. Low side to chassis.	A7	Use high scope gain and generator output. Adjust for MINIMUM 400∿ response on scope.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide useable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC 47.25MC	Any	Vert. Amp. to point ⟨A⟩. Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch A1 thru A5 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Short pin 1 (grid) of 6CB6 (V5) to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to pin 7 (plate) of 6AL5 (V6). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru 10KΩ to point ⟨B⟩. Common to chassis.	A8, A9, A10	Adjust for maximum deflection. Attenuate generator output to maintain about 1 volt above noise voltage at VTVM.
9.	"	"	"	"	DC probe thru 10KΩ to point ⟨C⟩. Common to chassis.	A11, A12	Detune A12 for maximum negative deflection (A12 is top adjustment on part nos. 708018, 708151, bottom adjustment on part #708017). Adjust A11 for maximum deflection. Readjust A12 for zero reading on VTVM. A positive and negative reading will be obtained on either side of the correct setting. Remove short from grid of V5 to chassis.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Short pin 1 (grid) of 6CB6 (V5) to chassis.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to pin 7 (plate) of 6AL5 (V6). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 10KΩ to point ⟨B⟩. Low side to chassis.	A8, A9, A10	Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
9.	"	"	"	"	"	Vert. Amp. thru 10KΩ to point ⟨C⟩. Low side to chassis.	A11, A12	Adjust A11 for maximum amplitude and straightness of crossover lines as in Fig. 3. Adjust A12, (A12 is top adjustment on part nos. 708018, 708151, battery adjustment on part #708017) so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines. Remove short from grid of V5 to chassis.

4.5 MC TRAP ALIGNMENT

Set contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig. 4) to pin 11 of picture tube. Low side to chassis.	A13	Adjust for MINIMUM deflection.

ALTERNATE 4.5 MC TRAP ALIGNMENT

Tune in a TV station and adjust fine tuning control to emphasize 4.5MC beat interference in picture. Adjust A13 to minimize the 4.5MC beat interference.

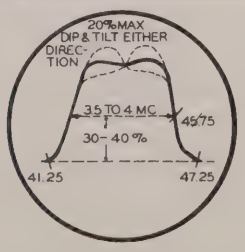


FIG. 1

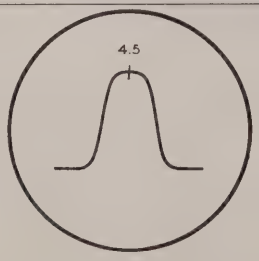


FIG. 2

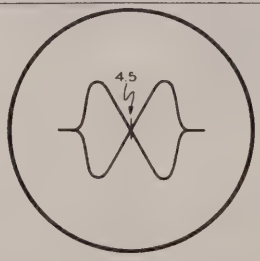


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

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OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the bias battery as under "Video IF Alignment".
Also, connect a jumper from the negative lead to the ungrounded side of C39.
The channel oscillator adjustment screws are reached thru a hole just to the right and slightly above the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. to point (A). Low side to chassis.	A14	Advance scope gain so that sound trap notch is visible on response curve. Adjust to place sound marker in trap notch. Video marker should fall at 30 to 40% response on opposite slope of response curve as in Fig. 5.
			213MC (10MC Swp)	211.25MC 215.75MC	13		A15	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A16	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A17	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A18	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A19	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A20	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A21	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A22	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A23	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A24	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A25	

RF AND MIXER ALIGNMENT (Tuner # 470712 and # 470696)

Connect bias battery as under "Oscillator Alignment ".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Tuner 470696 utilizes an IF trap (A29) in the tuner.
Normally, A29 is set for maximum capacitance (screw fully clockwise). Should a near by transmitter cause interference on channel 2, A29 may be adjusted in the field to minimize this interference.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (D). Low side to chassis	A26, A27 A28	Adjust for maximum response similar to Fig. 6.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel make compromise adjustments of A26, A27 and A28 with channel switch set to that channel then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

Complete tuner alignment should not be required in the field. If the oscillator tube (6J6) is replaced it may be necessary to adjust A36. Adjust A36 to track the highest UHF channel available in that area. If the output IF transformer slug (A37) has been tampered with readjust A37 for best picture and sound on all UHF channels received in that area.

RADIO ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
14.	.01MFD	High side to pin 1 (grid) of RF Amp (6BJ6). Low side to B-.	455KC (400∿Mod)	Radio	Tuning gang fully open	Across voice coil	A30, A31 A32, A33	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
15.		Loop	1630KC	"	"	"	A34	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
16.		"	1400KC	"	"	"	A35	"

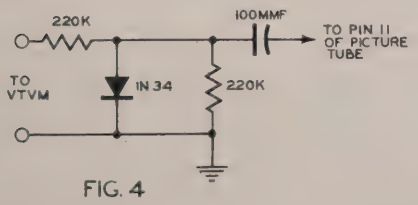


FIG. 4

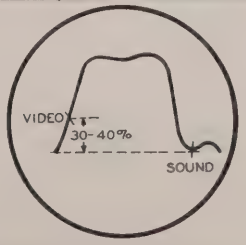


FIG.5

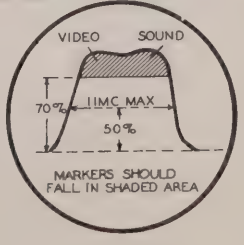
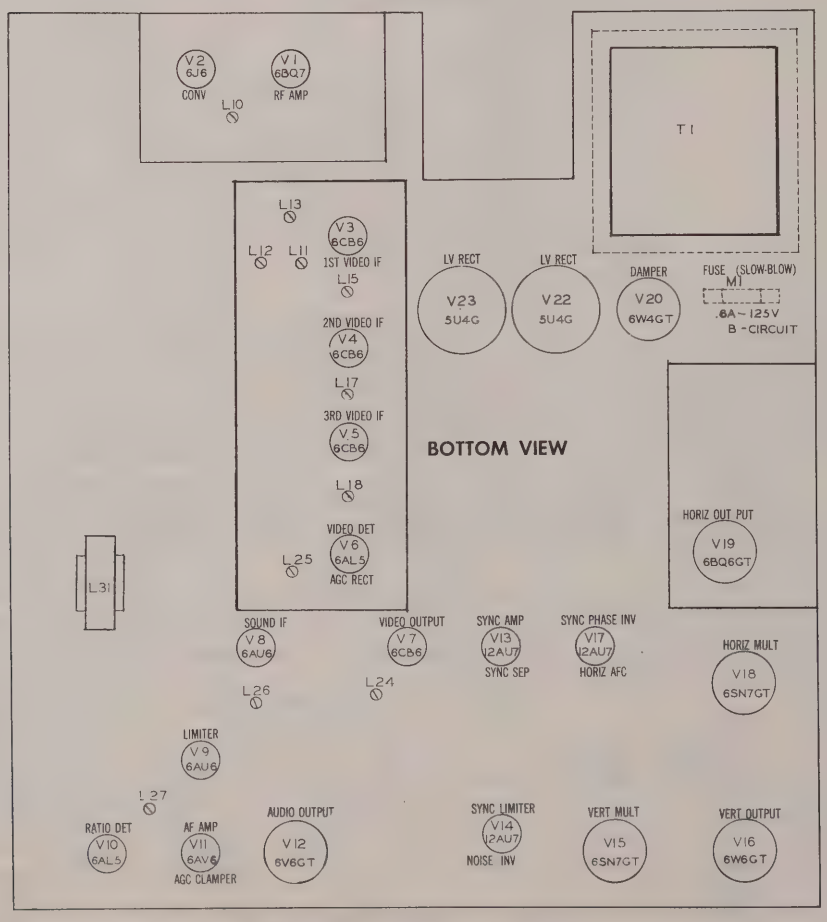


FIG.6

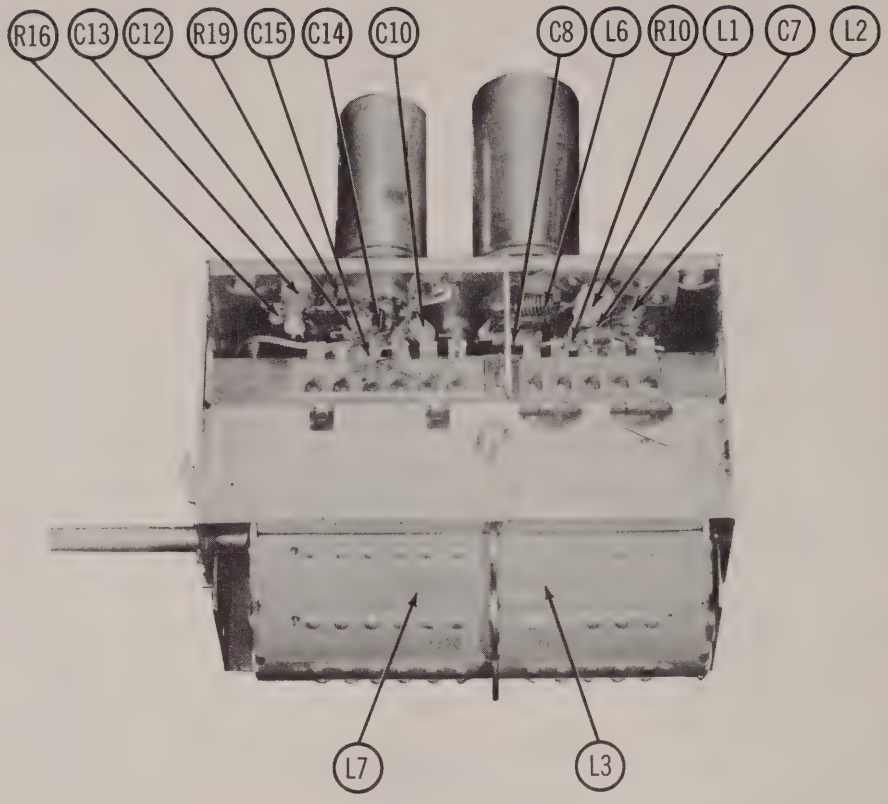
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	2.1Meg	0Ω	.1Ω	0Ω	†560Ω	230KΩ	INF	0Ω
V 2	6J6	†6KΩ	†16.2KΩ	.1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 3	6CB6	1Meg	47Ω	.1Ω	0Ω	†1.7KΩ	†1.7KΩ	0Ω		
V 4	6CB6	1Meg	47Ω	.1Ω	0Ω	†1.7KΩ	†1.7KΩ	0Ω		
V 5	6CB6	.1Ω	180Ω	.1Ω	0Ω	†1.7KΩ	†1.7KΩ	0Ω		
V 6	6AL5	.1Ω	1.1Meg	.1Ω	0Ω	105KΩ	0Ω	4.7KΩ		
V 7	6CB6	1Meg	1.5KΩ	.1Ω	0Ω	†6.9KΩ	†1.2KΩ	1.5KΩ		
V 8	6AU6	1Meg	0Ω	0Ω	.1Ω	†1.7KΩ	†1.7KΩ	267Ω		
V 9	6AU6	47KΩ	0Ω	0Ω	.1Ω	†1.7KΩ	†29KΩ	0Ω		
V 10	6AL5	0Ω	100KΩ	0Ω	.1Ω	200KΩ	0Ω	100KΩ		
V 11	6AV6	10Meg	0Ω	0Ω	.1Ω	2.1Meg	2.1Meg	†220KΩ		
V 12	6V6GT	INF	.1Ω	†1.8KΩ	†1.5KΩ	470KΩ	100KΩ	0Ω	470Ω	
V 13	12AU7	†32KΩ	15KΩ	0Ω	.1Ω	.1Ω	†23KΩ	2.3Meg	0Ω	0Ω
V 14	12AU7	†150KΩ	2.2Meg	20KΩ	0Ω	0Ω	2.2Meg	470KΩ	0Ω	.1Ω
V 15	6SN7GT	100KΩ	†150KΩ	2.2KΩ	1.4Meg	▲2.1Meg	2.2KΩ	.1Ω	0Ω	
V 16	6W6GT	INF	0Ω	†400Ω	†500Ω	2.2Meg	▲1.1Meg	.1Ω	1.2KΩ	
V 17	12AU7	22KΩ	265KΩ	100KΩ	0Ω	0Ω	†6KΩ	330KΩ	4.7KΩ	.1Ω
V 18	6SN7GT	2.4Meg	†20KΩ	1.2KΩ	130KΩ	†125KΩ	1.2KΩ	.1Ω	0Ω	
V 19	6BQ6GT	INF	0Ω	INF	†6.9KΩ	470KΩ	INF	.1Ω	100Ω	TOP CAP ▲64Ω
V 20	6W4GT	INF	INF	100KΩ	INF	†95Ω	INF	▲30Ω	▲30Ω	
V 21	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲590Ω
V 22	5U4G	INF	13KΩ	INF	26Ω	8.5Ω	26Ω	INF	13KΩ	
V 23	5U4G	INF	13KΩ	INF	27Ω	INF	27Ω	INF	13KΩ	
V 24	21MP4	0Ω	0Ω	PIN 6 25Ω	PIN 10 ▲680KΩ	PIN 11 †280KΩ	PIN 12 .1Ω			

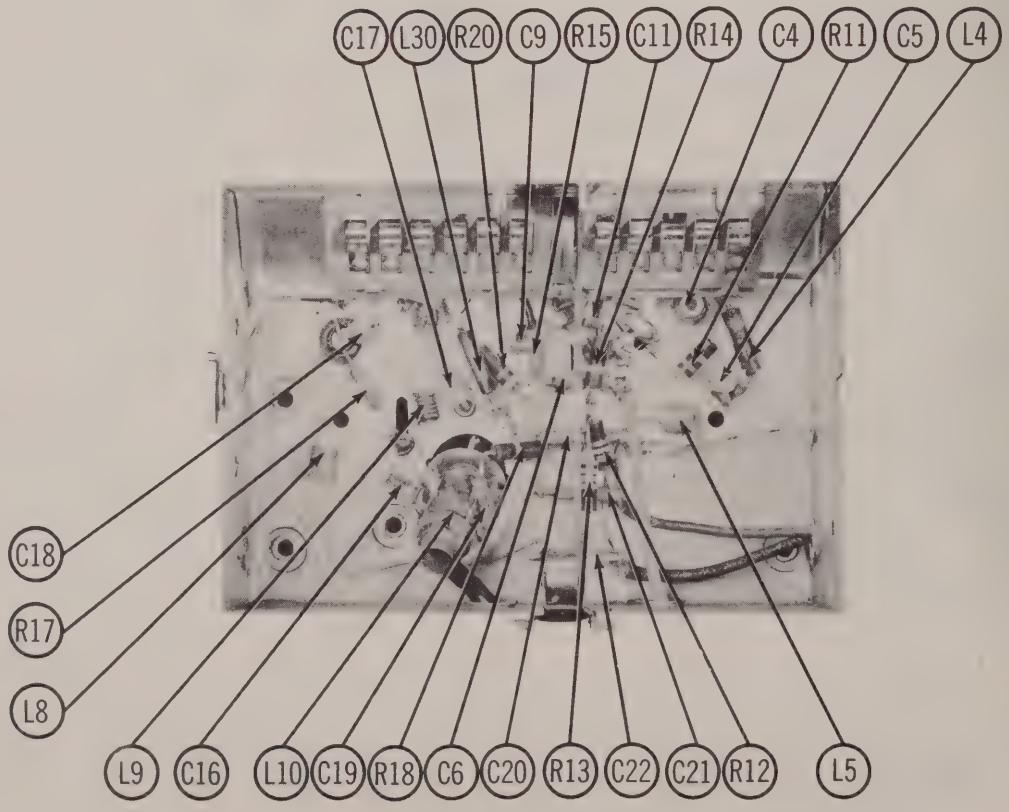
† MEASURED FROM PIN 8 OF V23
▲ MEASURED FROM PIN 3 OF V20



TUBE PLACEMENT CHART

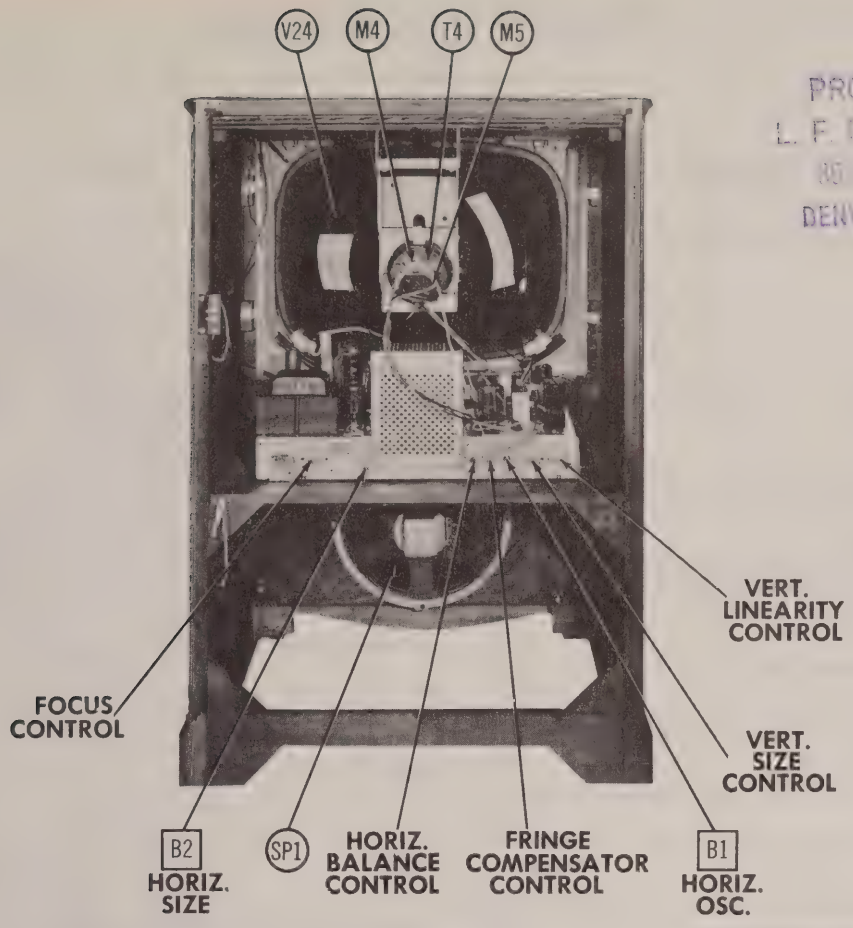


VHF TUNER-RIGHT SIDE



VHF TUNER- BOTTOM VIEW

PROPERTY OF
L. F. CLARKENSHIP
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Turn the fringe compensator switch to "off" position.

Adjust the horizontal oscillator as follows:

1. Turn the horizontal hold control to its mid-range position.
2. Short the horizontal oscillator coil (L28) by means of a clip lead from the yellow to the white wire on the terminal strip on top of chassis near V18.
3. Short the horizontal control grid (pin 1) of V18 to chassis. (Brown wire on same terminal strip as in step 2) .
4. Adjust the horizontal balance control on rear of chassis until picture pulls into sync. (picture may sway from side to side).
5. Remove short from horizontal oscillator coil and adjust the horizontal oscillator slug (B1) for same synchronous condition as in step 4.
6. Remove short from horizontal control grid.
7. Momentarily remove signal by switching off channel and back again. If picture does not fall in sync readjust horizontal hold control until picture falls in sync after momentary removal of signal.

Adjust the horizontal size slug (B2) for a picture slightly wider than necessary to fill picture mask horizontally.

FRINGE COMPENSATOR ADJUSTMENT

Tune in the weakest TV signal available and adjust the fringe compensator control (R7A) for the most stable picture. Repeat procedure on all channels and adjust R7A as necessary for best overall picture stability. In strong signal areas the fringe compensator should be left in "off" position to prevent picture instability.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V18, V19, V20, V22 and V23. Check adjustments B2. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check C88, C89, R117, R118, R119, T2, T4A and other associated components.	R108, R114, C85, C87 and other associated components.

DRIVE LINES

Check by substitution V18, V19 and V20. Check T2, T4A, C92, C90, R111, R114, R119 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V18, V19, and V20. Check adjustment of the horizontal size slug, B2. Check components associated with the horizontal output and damper stages especially T2 and T4A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check C81 for open. Check V19, V20, T2 and T4A for internal arcing.

XMAS TREE EFFECT

Substitute V18. Check C82, C83, C84, L28 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R5, R92 and other associated circuit components.	Check R89, R91, C68, C71 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check T3, T4B, C2B and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V15 and V16. Check C69, C70, C71, R89, R90, R91 and other associated components.

FOLDS

Check components associated with the vertical oscillator and output stages.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V13 and V14. Check C59, C60, C61, C62, C63, R68, R70, R72, R73 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V13, V14 and V15. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check components associated with V15 especially C68, R86 and R87.	Check vertical integrator and other associated components. Check the video and IF stages for overloading.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check C82, C83, C84 and other associated components.	Check components associated with V17.

HORIZONTAL BENDING

Check by substitution V17, V18 and V19. Check the horizontal AFC filter network for component failure or change of value.

VIDEO

LOSS OF VIDEO

Substitute V7 and V6. Check associated components including picture tube for failure or change of value.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check adjustment A13 and video IF alignment.

POOR CONTRAST

Check by substitution V6 and V7. Check contrast control, picture tube and other associated components.

NEGATIVE PICTURE

Check by substitution V6, V7, V1, V3 and V4. Check AGC network components. Check picture tube and other associated circuit components.

SMEAR

Substitute V6 and V7. Check C41, C43, R39, R41, R44, L20, L21, L22, L23, picture tube and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check V1, V3, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9, V10, V11 and V12. Check stages V11 and V12 using audio signal generator. Apply audio signal across R59.

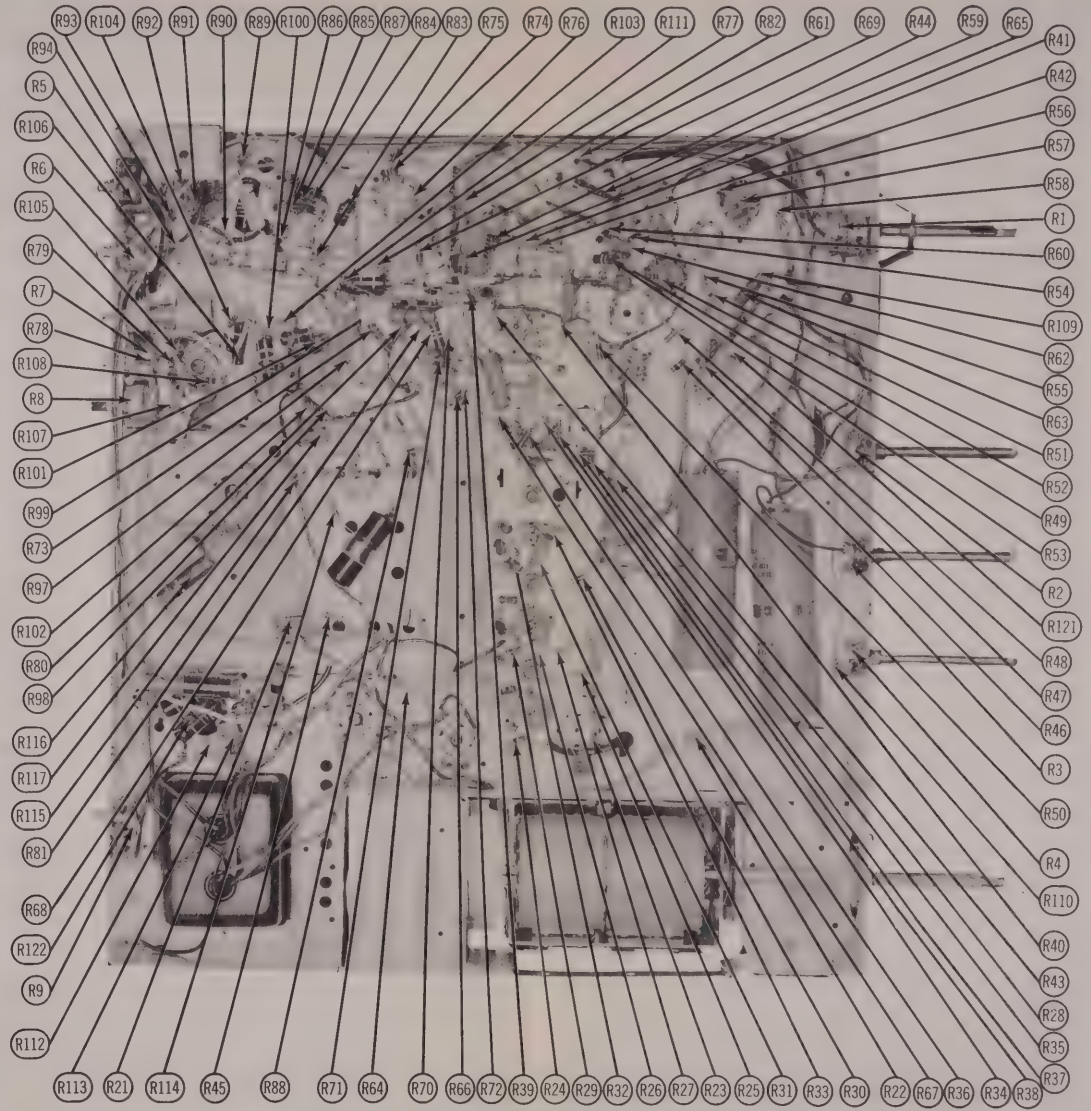
If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment at components.	Check R60, R61, R62, R63, T6, C57 and other associated circuit components.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A12 for minimum buzz. If still unsatisfactory, substitute V10 and realign audio IF and ratio detector stages.

DISTORTED

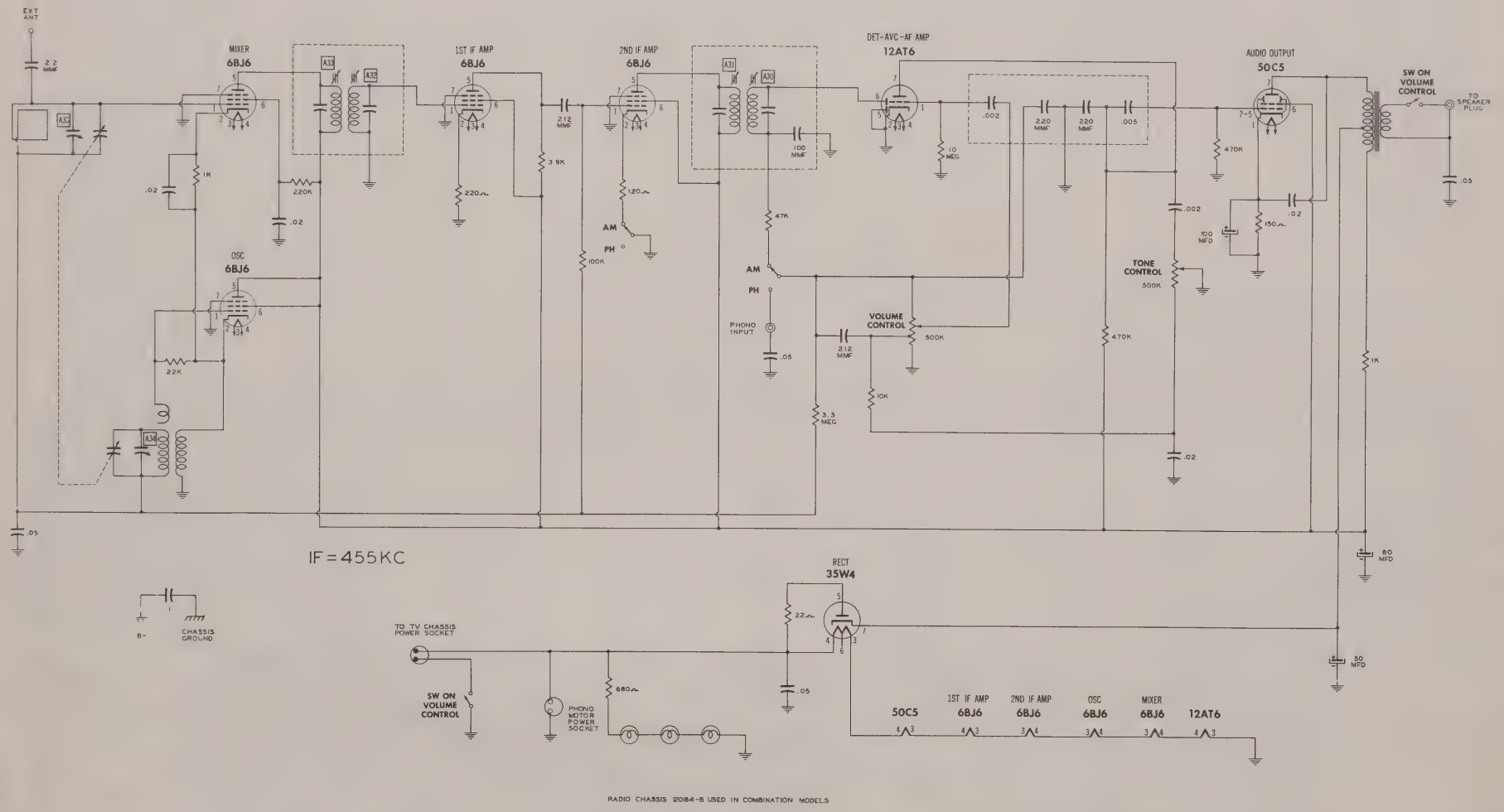
Follow procedures outlined under "Weak or No Sound".



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
F. E. BLANKENSHIP
392[illegible] MEADE ST.
DENV[illegible]R, COLORADO

EMERSON MODELS 732G, 742E, 752A, B, 753D, F, 755A, B, 760D, H, 761C, 762D, F, 766D, 767A, B, 768A, 770C, 771A, B, D, 772A, 773A, 774A, 775A, B, 784A, 785C, E, 791D, 795C, 799E (Ch. 120174-B, 120180-D, 120184-B, 120185-B, 120190-D, 120191-D, 120192-B, -F, 120193-B, 120198-D, 120209-D, F, 120210-D)



RADIO CHASSIS 120184-B USED IN COMBINATION MODELS

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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EMERSON MODELS 732G, 742E, 752A, B, 753D, F, 755A, B, 760D, H, 761C, 762D, F, 766D, 767A, B, 768A, 770C, 771A, B, D, 772A, 773A, 774A, 775A, B, 784A, 785C, E, 791D, 795C, 799E (Ch. 120174-B, 120180-D, 120184-B, 120185-B, 120190-D, 120191-D, 120192-B, -F, 120193-B, 120198-D, 120209-D, F, 120210-D)

RADIO SCHEMATIC

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Amplifier-AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Output	6CB6	6CB6	7CM	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Limiter	6AU6	6AU6	7BK	
V10	Discriminator	6AL5	6AL5	6BT	
V11	AF Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V12	Audio Output	6V6GT	6V6GT	7S	
V13	Sync Amplifier-Sync Separator	12AU7	12AU7	9A	
V14	Sync Limiter-Noise Inverter	12AU7	12AU7	9A	
V15	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V16	Vert. Output	6W6GT	6W6GT	7S	
V17	Horiz. Sync-Phase Inv.-Horiz.AFC	12AU7	12AU7	9A	
V18	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V19	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V20	Damper	6W4GT	6W4GT	4CG	
V21A	HV Rectifier	1B3GT	1B3GT	3C	
B	HV Rectifier	1X2	1X2	9Y	
V22	LV Rectifier	5U4G	5U4G	5T	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V24A	810028	21MP4	21MP4	21MP4	21MP4	12M	① Circuit changes necessary
B		21YP4	21YP4	21YP4	21YP4	12L	
		21YP4A		21YP4A		12L	
				21AFP4 ①		12M	
C	810029	17LP4	17LP4	17LP4	17LP4	12L	
		17VP4		17VP4		12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	80	300	925232	AFH2-64		XB014		FP378	TVL-3792	Blue
B	40	300		PRS450/4		BR445				Green
C	5	450								Red
C2A	40	250	925221	AFH3-182		C141		FP378	TVL-4711	Blue
B	100	50		PRS250/40		BR4025		TC3501		Green
C	10	450								Yellow
D	80	300								Red
C3	10	25	925180	PRS25/10		BR102		TC22	TVA-1204	
C4	3-8		960635		829-10					
C5	3-8		960635		829-10					
C6	1000		960407	EF-001	MFT-1000				503C-D1	
C7	3.3		960638	SI3.3NP0	TCZ-3.3	Z008	NP0K-3R3	ZT-5533	5TCCB-V33	
C8	1000		960407	EF-001	MFT-1000				503C-D1	
C9	.5-3		960634		829-3		3115-01-0R5	CT565A		
C10	120		960136	BPD-00012	D6-121	G044	GP2K-121	UC-5312	5GA-T12	
C11	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C12	51			BPD-000047	D6-470	G035	GP1K-470	UC-5447	5GA-Q47	
C13	.5-3		960634		829-3		3115-01-0R5	CT565A		
C14	10		960636	SI10NP0	TCZ-10	Z018	NP0K-100	ZT-541	5TCC-Q1	
C15	5		960637	SI5N750	TCN-5	N011	N750K-050		5TCUB-V5	
C16	6.8		960639	SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C17	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C18	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C19	1500			BPD-0015	DD-152	K071	801-0015	DC-521	5HK-D15	
C20	1000		960407	EF-001	MFT-1000				503C-D1	
C21	1000		960407	EF-001	MFT-1000				503C-D1	
C22	1000		960407	EF-001	MFT-1000				503C-D1	
C23	5000		928109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C24	39		928082	SI39NP0	TCZ-39	TZ20	NP0K-390		5TCC-Q39	
C25	6.8		928084	SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C26	1000		928077	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C27	470		928081	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C28	1000		928077	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C29	.22	200	922325	P288-22		CUB2P22		PT4022	2TM-P22	
C30	470		928081	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C31	1000		928077	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C32	5000		928109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C33	680		928076	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C34	680		928076	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C35	1000		928077	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	22		928012	SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C37	1000		928077	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	1000		928077	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	.22	200	922325	P288-22		CUB2P22		PT4022	2TM-P2 2	
C40	5		928017	SI5NP0	TCZ-4.7	Z011	NP0K-050	ZT-555	5TCCB-V47	
C41	.047	400	922554	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C42	1000		928077	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C43	.047	400	922554	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C44	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C45	.01	600	922714	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C46	5000		928109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C47	5000		928109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C48	5000		928109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C49	5000		928109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C50	68	500	911181	B68	D5-580	5W5Q68	GP1K-680	UC-5468		
C51	5000		928109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C52	5000		928109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C53	100	500	911182	1468-0001	D5-101	5W5T1	GP1K-101	MC325	1FM-J1	
C54	.0022	400	922533	P688-0022	D6-222	CUBD6D22	GP2-333-222	PT6222	6TM-D22	
C55	.0047	400	922553	P688-0047	D6-472	CUBD6D47	GP2-333-472	PT6247	6TM-D47	
C56	.001	400	922512	P688-001	D6-102	CUBD6D1	GP2L-102	PT621	6TM-D1	
C57	.047	400	922554	P488-047	DF-503	CUBA5A47		PT4147	4TM-S47	
C58	.0047	400	922553	P688-0047	D6-472	CUBD6D47	GP2-333-472	PT6247	6TM-D47	
C59	.01	400	922514	P688-01	D6-103	CUBD6D1	GP2-333-103	PT611	6TM-D1	
C60	100	500	911486	1469-0001		22R5T1		MCB235	MS-31	
C61	.22	200	923325	P288-22		CUB2P22		PT4022	2TM-P22	
C62	.1	200	923315	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C63	.01	400	922514	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C64	220	500	911184	1469-00025		22R5T22		MCB240		
C65	.0022	400	922523	P688-0022	D6-222	CUBD6D22	GP2-333-222	PT6222	6TM-D22	
C66	.0047	400	922553	P688-0047	D6-472	CUBD6D47	GP2-333-472	PT6247	6TM-D47	
C67	.01	400	922514	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C68	.0047	400	922453	1454-005		1R5D4		MCB455	MS-25	
C69	.047	200	922354	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C70	.047	400	922454							
C71	.1	600	922515	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C72	.01	600	922714	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C73	82	500	911160			22R5Q82				
C74	680	500	911216	1479-0007		5R5T68				
C75	470	500	911169	1469-0005		5R5T47		MCB245	MS-35	
C76	.001	400	922513	P688-001	D6-102	CUBD6D1	GP2L-102	PT621	6TM-D1	
C77	.0022	400	922523	P688-0022	D6-222	CUBD6D22	GP2-333-222	PT6222	6TM-D22	
C78	.001	600	922713	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C79	.001	400	922513	P688-001	D6-102	CUBD6D1	GP2L-102	PT621	6TM-D1	
C80	.001	400	923513	P688-001	D6-102	CUBD6D1	GP2L-102	PT621	6TM-D1	
C81	.015	400	922320	P688-015		CUB6S15		PT615	6TM-S15	
C82	100	500	911161	1469-0001		22R5T1		MCB235	MS-31	
C83	.0047	600	922653	1464-005		1R5D47		MCB465	MS-25	
C84	220	500	911165			22R5T22				
C85	390	500	911168	1469-0004		5R5T39		MCB240	MS-34	
C86	.015	200	922320							
C87	.001	400	923413	1464-001		1R5D1		MCB355	MS-21	
C88	.1	400	922515	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C89	.22	200	923325	P288-22		CUB2P22		PT4022	2TM-P22	
C90	.1	600	922715	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C91	500	20000	923016	HV20C	TV3-503	MMU20T5	413	HV20035A	20DK-T5	Note 1
C92	50	2000	928097							
C93	.047	400	922220	4892X-05	DF-503	CUB4S47		PT4147	4TM-S47	
C94	.047	400	922220	4892X-05	DF-503	CUB4S47		PT4147	4TM-S47	
C95	1000		928077	P88-001	DD-102		801-001	DC-521	5HK-D1	Note 2

Note 1. Not used in Ch. 120190D, 120191D, 120192D, 120198D
Note 2. Used in Ch. 120174B and 120198D only.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1500Ω	½	390201	*QJ-313	RTV-296	SBB-701-S	UF152H	Contrast - Panel
B	1 Meg						UR16A †	Volume - Rear
C	Switch						US-26	Attach to R1B
R2A	200KΩ	½	390181	QU-129	A47-200K-S	AB-46	U-43	Brightness
B	Shaft		Not Req.	C3	KSS-5	AK-4	DS-36	Attach to R2A
R3A	1 Meg	½	390156	QU-137	A47-1Mes-S	AB-69	U-54	Vert. Hold
B	Shaft		Not Req.	C3	KSS-3	AK-4	DS-36	Attach to R3A
R4A	50KΩ	½	390183	QU-123	A47-50K-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	C3	KSS-5	AK-4	DS-36	Attach to R4A
R5A	5000Ω	2	390197	WK-5000	A43-5000	VK-135	R5000L	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6A	2 Meg	½	390196	QU-139	A47-2Meg-S	AB-75	SU-56	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	50KΩ	½	390225	QU-123	A47-50K-S	AB-31	U-53	Prince compensator
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
C	Switch		Not Req.	78-1	SWE-12	KB-1	US-26	Attach to R7A
R8A	200KΩ	½	390219	QU-129	A47-200K-S	AB-46	U-43	Horiz. Balance
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A
R9A	2Meg	½	390198	QU-139	A47-2 Meg-S	AB-75	SU-56	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R9A

* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B17-110 & P1-224 (Panel)
B13-137 & R1-308 (Resr) & SWITCH 76-1.
† UNIVERSAL REPLACEMENT (MALLORY EXACT DUPLICATE PART NO UE2058)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA EMERSON PART No.	IRC PART No	NOTES
R10	15KΩ			BTS-15K	
R11	47KΩ			BTS-47K	
R12	180KΩ			BTS-180K	
R13	330KΩ			BTS-330K	
R14	100KΩ			BTS-100K	
R15	47Ω			BTS-470	
R16	15KΩ			BTS-15K	
R17	230KΩ			BTS-230K	
R18	15KΩ			BTS-15K	
R19	10KΩ			BTS-10K	
R20	4700Ω			BTS-4700	
R21	470Ω		350412	BTS-470	
R22	470Ω		350412	BTS-470	
R23	15Ω		340052	BTS-15	
R24	47Ω		340172	BTS-47	
R25	470Ω		350413	BTS-470	
R26	27KΩ		340832	BTS-27K	
R27	470Ω		350413	BTS-470	
R28	470Ω		350412	BTS-470	
R29	47Ω		340172	BTS-47	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA EMERSON PART No.	IRC PART No	NOTES
R30	470Ω		350412	BTS-470	
R31	8200Ω 5%		340712	BTS-8200 5%	
R32	180Ω		340312	BTS-180	
R33	330KΩ		350413	BTS-470	
R34	100KΩ		.350972	BTS-100K	
R35	1 Meg		351212	BTS-1 Meg	
R36	1 Meg		351212	BTS-1 Meg	
R37	1 Meg		351212	BTS-1 Meg	
R38	15KΩ		340772	BTS-15K	
R39	1 Meg		351212	BTS-1 Meg	
R40	22KΩ		340812	BTS-22K	
R41	6800Ω 5%		770692		
R42	220KΩ		351052	BTS-220K	
R43	470KΩ		351132	BTS-470K	
R44	470KΩ		351132	BTS-470K	
R45	680KΩ		351172	BTS-680K	
R46	47Ω		340172	BTS-47	
R47	220Ω		340332	BTS-220	
R48	470Ω		350412	BTS-470	
R49	47KΩ		350892	BTS-47K	

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA EMERSON PART No.	IRC PART No.	NOTES
R50	1 Meg		351213	BTS-1 Meg	
R51	10KΩ		340732	BTS-10K	
R52	6800Ω		340692	BTS-6800	
R53	22KΩ	1	370812	BTA-22K	
R54	10 Meg		351452	BTS-10 Meg	
R55	470Ω	5	350413	BTS-470	
R56	100KΩ		340972	BTS-100K	
R57	100KΩ		340972	BTS-100K	
R58	68KΩ		350932	BTS-68K	
R59	10 Meg		351452	BTS-10 Meg	
R60	220KΩ		351052	BTS 220K	
R61	470KΩ		351132	BTS-470K	
R62	470Ω	1	370412	BTA-470	
R63	1500Ω	2	790532	BTB-1500	
R64	8500Ω	5	394122		
R65	22KΩ		340812	BTS-22K	
R66	10KΩ		340732	BTS-10K	
R67	4700Ω		340852	BTS-4700	
R68	22KΩ	1	340812	BTA-22K	
R69	10KΩ		340732	BTS-10K	
R70	33KΩ		340852	BTS-33K	
R71	100KΩ		350972	BTS-100K	
R72	2. 2 Meg		351292	BTS- 2. 2Meg	
R73	22KΩ	1	370812	BTA-22K	
R74	470KΩ	1	351132	BTA-470K	
R75	2. 2Meg	1	351292	BTA-2. 2 Meg	
R76	150KΩ			BTS-150K	
R77	68KΩ			BTS-68K	
R78	10KΩ		340732	BTS-10K	
R79	10KΩ		340732	BTS-10K	
R80	5600Ω		340672	BTS-5600	
R81	390Ω	1		BTS-390	
R82	22KΩ	1		BTS-22K	
R83	8200Ω	1		BTS-8200	
R84	100KΩ	1	340972	BTS-100K	
R85	2200Ω	1		BTS-2200	
R86	150KΩ	1		BTS-150K	

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA EMERSON PART No	IRC PART No	NOTES
R87	830KΩ			BTS-820K	
R88	47KΩ		350892	BTS-47K	
R89	1 Meg		351213	BTS-1 Meg	
R90	12KΩ			BTS-12K	
R91	2. 2Meg		351292	BTS-2. 2Meg	
R92	470Ω		350413	BTS-470	
R93	100Ω			BTS-100	
R94	33KΩ		340852	BTS-33K	
R95	560Ω			BTS-560	
R96	560Ω			BTS-560	
R97	330KΩ		351092	BTS-330K	
R98	4700Ω		340852	BTS-4700	
R99	4700Ω		340852	BTS-4700	
R100	82KΩ		340952	BTS-82K	
R101	100KΩ		340972	BTS-100K	
R102	22KΩ		340812	BTS-22K	
R103	82KΩ		340952	BTS-82K	
R104	2. 2Meg		351292	BTS- 2. 2Meg	
R105	12000 5%		330512	BTS-1200 5%	
R106	15KΩ 5%		330772	BTS-15K 5%	
R107	47KΩ		340892	BTS-47K	
R108	1200K		340992	BTS-1200K	
R109	3900Ω			BTS-3900	
R110	47KΩ	1	350892	BTS-47K	
R111	6800Ω	1	340892	BTS-6800	
R112	47KΩ	1	370892	BTA-47K	
R113	47KΩ	1	370892	BTA-47K	
R114	470KΩ	1	351132	BTA-470K	
R115	68Ω	1		BTS 68	
R116	100Ω	2			
R117	6800Ω	2		BTB-6800	
R118	33Ω	1		BTS-33	
R119	8200Ω	1		BTA-8200	
R120	100KΩ	1		BTS-100K	Note 2
R121	1250Ω	10			
R122	100KΩ	1		BTA-100K	
R123	470Ω	1	350412	BTS-470	Note 1
R124	100KΩ	1	340972	BTS-100K	Note 1

Note 1. Used in chassis No. 120174-B & 120198-D only.
Note 2. Not used in chassis 120190-D, 120191-D or 120192-D

TRANSFORMER (POWER)

ITEM No	RATING PRI	RATING SEC 1	RATING SEC 2	REPLACEMENT DATA EMERSON PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Halldorson PART No	Thordarson PART No
T1	117VAC @ 1. 76A	462VCT @ 270ADC	5VAC @ 6A	720044 730037 ①						
	SEC. 3	SEC. 4	SEC. 5							
	& 3VAC @ 1. 2A	12. 6VCT @ 4. 7A								

① Used in chassis 120185-B, and 120190-D

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA EMERSON PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Halldorson PART No	Thordarson PART No
T2	Horiz. Output Trans.	738068 738062 ① 738067 ①	*A-8232	*HV0-9	*D-19	*225T1	*FB41	*FLY-13
T3	Vert. Output Trans.	738086 738083 ①	A-8142 ②	A-3038 ④	A-108X	Z1802 ⑤	T-26953 ⑥	
T4A	Yoke - Horiz. (20MH)	708137	DY-11A	MDF-73	Y-22-1	222D1	DF805	Y-10
B	Yoke - Vert. (37MH)							
T5	Width Coil (1-8.3MH)	708068 708150 ⑦	WC-8	MWC-6 ③	WC-12 ⑦	21ZR1		

① Alternate horizontal output transformer.
② Drill new mounting holes.
③ Remove resistor R11B.
④ Connect as auto transformer.
⑤ Alternate width coil.
⑥ Enlarge mounting hole.
⑦ Connect to coded blue and green terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
	3	3	Hi-Volt Rect Plate Lead	Hi-Volt Rect Plate Lead	Hi-Volt Rect Plate Lead	Hi-Volt Rect Plate Lead	3
	2	2	9	9	9	9	2
	7	7	7	8	8	5	7
	5	5	8	7	7	8	5
	4	4	4	4	4	4	4
	6	6	3	3	3	3	6
	8	8	1	1	1	1	8
Connect Width Coil Across →	6 & 8	6 & 8	3 & 1	3 & 1	3 & 1	3 & 1	6 & 8
Special Notes →			②③	②	②	②③	

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA EMERSON PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No	NOTES
T6	4. 6K	3. 4Ω	734074	A-3877 1	A-3019	S-3X 1	Z1002	26849	

SPEAKER

ITEM No	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	REPLACEMENT DATA EMERSON PART No	VIKING PART No	QUAM PART No	NOTES
SP1A	12	PM	3.4Ω	160120	12211	12A31	1. Used with Ch. 120190-D and 120191-D
B	6	PM	3.4Ω	180095 1	624	6A1	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA EMERSON PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	NOTES
L1	IF Trap	0Ω						Wound on 68MMF Cap.
L2	IF Trap	0Ω						Wound on 68MMF Cap.
L3	Ant. Coils	0Ω CT	0Ω					
L4	IF Trap	.9Ω						
L5	Fil. Choke	0Ω						
L6	Neutr. Coil	0Ω						
L7	RF, Mixer Grid & Osc. Coils	0Ω						
L8	Fil. Choke	0Ω						
L9	Feedback Coil	1.4Ω						6.8 Microhenries
L10	Conv. Plate	0Ω	0Ω					
L11	Adj. Channel Sound Trap	0Ω		740154	20-1047 *		6219 ■	
L12	Associated Sound Trap	0Ω		720149	20-1046		6219 ■	
L13	Ist. Video IF	0Ω		720142 *			6231 ■	
L14	Fil. Choke	.44Ω		706020	19-3001	TV-189	6175	.68 Microhenry (IRC part #CLA)
L15	2nd. Video IF	.1Ω	.1Ω	720148 †	17-4523		6219	
L16	Fil. Choke	.44Ω		706020	19-3001	TV-189	6175	.68 Microhenry (IRC part #CLA)
L17	3rd Video IF	.1Ω	.1Ω	720148 †	17-4523		6219	
L18	4th. Video IF	.1Ω	.1Ω	720148 †	17-4523		6219	
L19	Fil. Choke	.44Ω		706020	19-3001	TV-189	6175	.68 Microhenry (IRC part #CLA)
L20	Shunt Peaking Coil	12Ω		708114	19-1923	TV-188	4566	440 Microhenries
L21	Series Peaking Coil	2.8Ω		705014	19-6022	TV-180	6152	20 Microhenries
L22	Series Peaking Coil	13Ω		708100	19-3250	TV-185	6181	250 Microhenries
L23	Shunt Peaking Coil	20Ω		708115	19-3680		4650	660 Microhenries
L24	4.5MC Trap	2Ω		708032 ♠	20-1004	TV-151	1170	
L25	1st. Sound IF	1Ω	2.4Ω	720146 ♣	16-3445	TV-113	6203	
L26	2nd. Sound IF	1.6Ω	2.4Ω	720081 ♣	16-3445	TV-113	6203	
L27	Discriminator	2.2Ω	2.6Ω CT	708151 ‡	17-4522 **	TV-114	6204	
L28	Horiz. Osc.	55Ω		706084	19-1676	TV-163	6210	
L29	RF Choke	8.2Ω		705071	19-1005		4612	10 Microhenries (IRC part #CL-1)
L30	RF Choke	0Ω						

♠ Alternate part #720182
* Alternate part #720156
† Alternate part #720175
♣ Alternate part #708164
♣ Alternate part #720185
‡ Alternate part #708018 and 708175
# Disconnect 22MMF capacitor across coil.
■ Use one winding only.
** Cut out 1 1/8" square chassis hole and drill mounting holes

FILTER CHOKE

ITEM No	RATINGS TOTAL DIRECT CURRENT	RATINGS D C RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~(a)	REPLACEMENT DATA EMERSON PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No
L31	175ADC	88Ω	1.5HY	737017 737018 ①	C-2327	C-2994 2	C-21X	C5040	T-26C41

1 Alternate filter choke.
2 Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA EMERSON PART No. FUSE	EMERSON PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M1	3AG S/B	6/10A 125V	808005		313.600 (3AG S/B-6/10A)	357001	MDL 6/10	4405

EMERSON MODELS 732G, 742E, 752A, B, 753D, F, 755A, B, 760D, H, 761C, 762D, F, 766D, 767A, B, 768A, 770C, 771A, B, D, 772A, 773A, 774A, 775A, B, 784A, 785C, E, 791D, 795C, 796E (Ch. 120174-B, 120180-D, 120184-B, 120185-B, 120190-D, 120191-D, 120192-B, -F, 120193-B, 120198-D, 120209-D, F, 120210-D)

PARTS LIST AND DESCRIPTIONS (Continued)

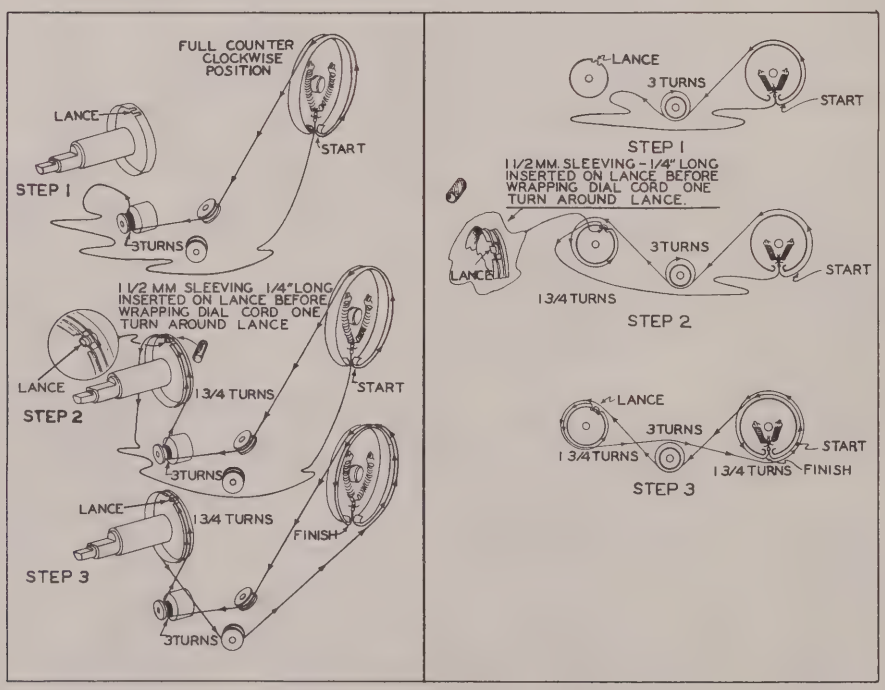
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2A	Tuner	470696	VHF- Chassis 120185-B, 190-D, 191-D, 192-B, D
B	Tuner	470712	VHF- Chassis 120174-B
M3A	Tuner	470713	UHF- Chassis 120174-B
B	Tuner	470729	UHF-Chassis 120198-D
M4	Centering Magnet	708149 or 708134	
M5	Ion Trap	708129 or 708161	
	Cabinet	140468	Model 753D & F
	Cabinet	140486	Model 732G
	Cabinet	140510 & A	Model 742E
	Cabinet	140517	Model 752A
	Cabinet	140524 & A	Model 785C
	Cabinet	140527	Model 755A
	Cabinet	140532 & A	Model 775A & B
	Cabinet	140534 & A	Models 760D & H, 761C
	Cabinet	140535	Model 762D & F
	Cabinet	140536 & A	Models 767A & B, 768A
	Cabinet	140537 & A	Models 771A, B & D, 772A
	Cabinet	140538	Models 773A, 774A
	Cabinet	140554 & A	Model 785E
	Cabinet	140555 & A	Models 784A
	Cabinet	140573 & A	Model 791D
	Cabinet	140575 & A	Models 766D, 770C
	Cabinet	140577 & A	Model 795C
	Cabinet	140583	Model 799E
	Knob	450138	Contrast
	Knob	450137	Fine tuning
	Knob	450134	Off/volume, shank
	Knob	460262	Off/volume, flange
	Knob	450133	Selector, shank
	Knob	460261	Selector, flange
	Knob	460424	Contrast
	Knob	460423	Fine tuning
	Knob	460422	Off/volume
	Knob	460421	Selector
	Knob	460425	UHF dial
	Safety Glass	520159	Models 753D & F, 760D & H, 761C, 762D & F
	Safety Glass	520179	Models 732G, 742E, 752A, 755A, 784A
	Safety Glass	520181	Models 785C & E
	Safety Glass	520189	Models 767B, 771B
	Safety Glass	520192	Models 766D, 767A,768A, 770C, 771A & D, 772A, 773A , 774A, 775A & B, 795C
	Safety Glass	520211	Model 791D, 799E

Note: Letter "A" following cabinet numbers designate blond finish

Used with Chassis 120185-B, 120190-D, 120191-D, 120192B, D & F, 120210-D

Used with chassis 120193-B, 120209-D, 120180-D, 120174-B, 120198-D



UHF DRIVE CORD STRINGING

PROPERTY OF
L. F. BLANKENSHIP
1844 MEADE ST.
DENVER, COLORADO

ALTERNATE TUNER SCHEMATIC

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, check fuse M1. Substitute V22 and V23. Check B+ filter and decoupling network components.

SMALL AND/OR DIM PICTURE

Substitute V22 and V23. Check B+ filter and decoupling components for failure or change of value.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V18, V19, V20 and V21. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check T2, T4A, T5, R116, R117, R118, R119, R120, C59, C61 and other associated components.	Check C87, C84, R106, R108, R114 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V18, V19, V20, V21, V22 and V23. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V18, V19, V20, V21, V22 and V23. Check T2, T4A, R116, R117, R118, R119, R120, C59, C61 and other associated circuit components.

GENERAL

RASTER SOUND NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PICTURE

Check by substitution V1, V2, V3, V4, V5, and V6. Check tuner and video IF components.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

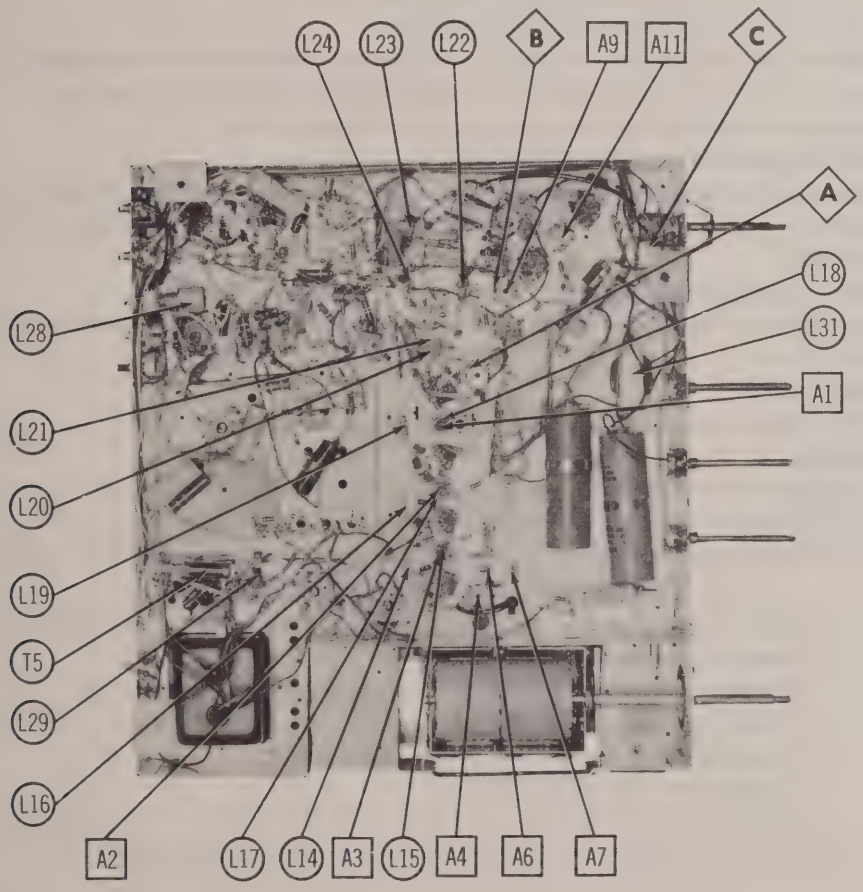
KEYSTONE EFFECT

Check T4, R95, R96, and C92.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

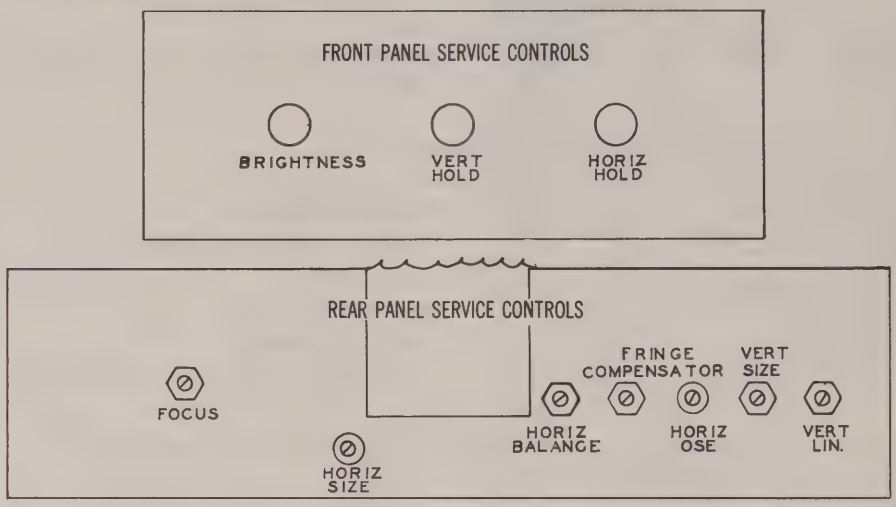
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove twelve (12) wood screws holding three metal strips at the front of the cabinet. Remove metal strips and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - FRINGE COMPENSATOR ADJUSTMENT

Tune in the weakest TV signal available and adjust the fringe compensator control (R7A) for the most stable picture. Repeat procedure on all channels and adjust R7A as necessary for best overall picture stability. In strong signal areas the fringe compensator should be left in "off" position to prevent picture instability.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal oscillator slug (L28) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary (L27) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push-on type control knobs from front panel.
2. Disconnect built-in antenna. Loosen 2 wood screws. Remove transmission line from cabinet.
3. Remove 8 wood screws. Remove rear cover.
4. Disconnect speaker leads, yoke leads, CRT socket and HV lead.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

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FLEETWOOD
MODEL 700

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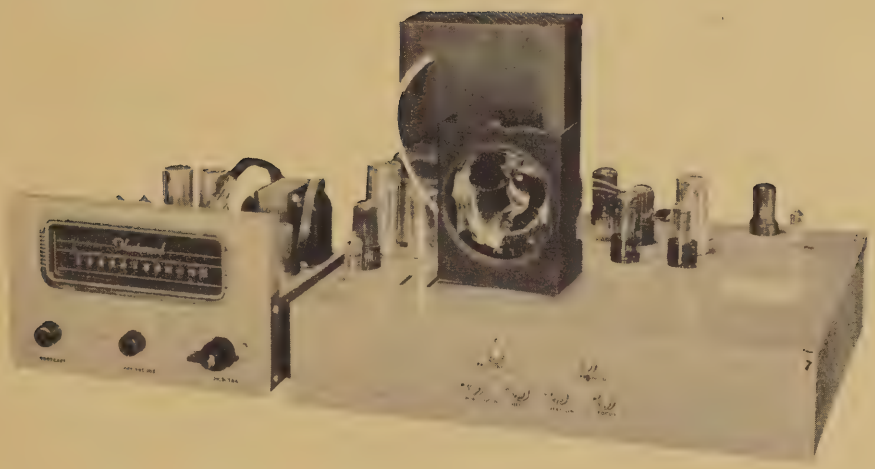

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MODEL 700

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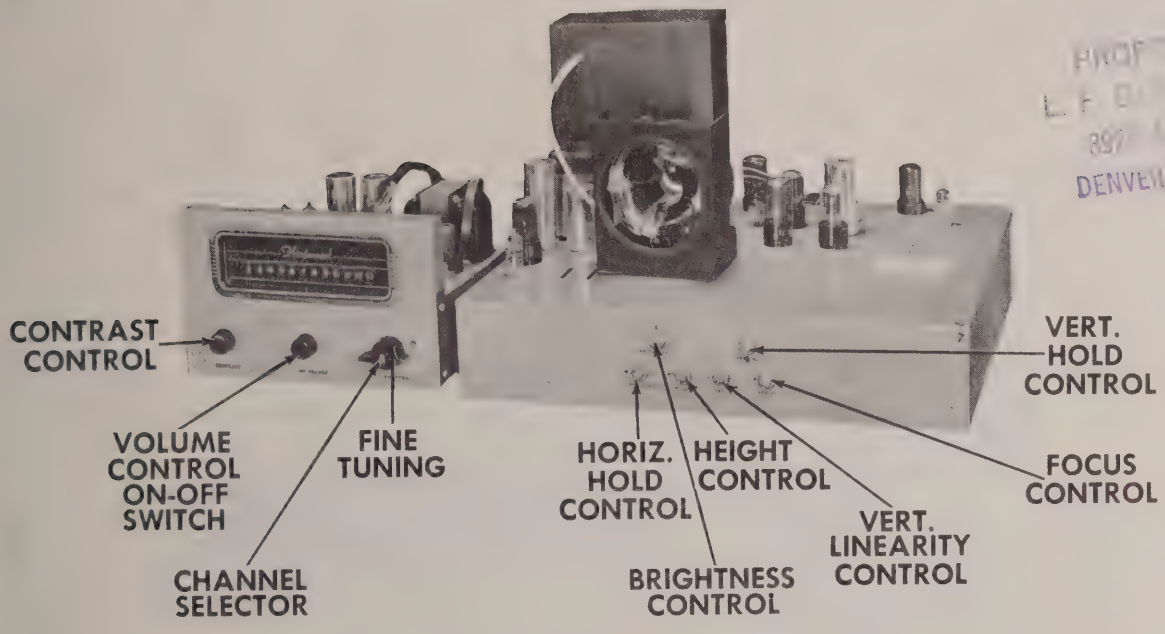

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FLEETWOOD MODEL 700

TRADE NAME	Fleetwood Model 700
MANUFACTURER	Conrac Inc., 649 W. Foothill Blvd., Glendora, Calif.
TYPE SET	Television Receiver
TUBES	Twenty-seven
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channel 2 thru 13 VHF, 14 thru 85UHF, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)

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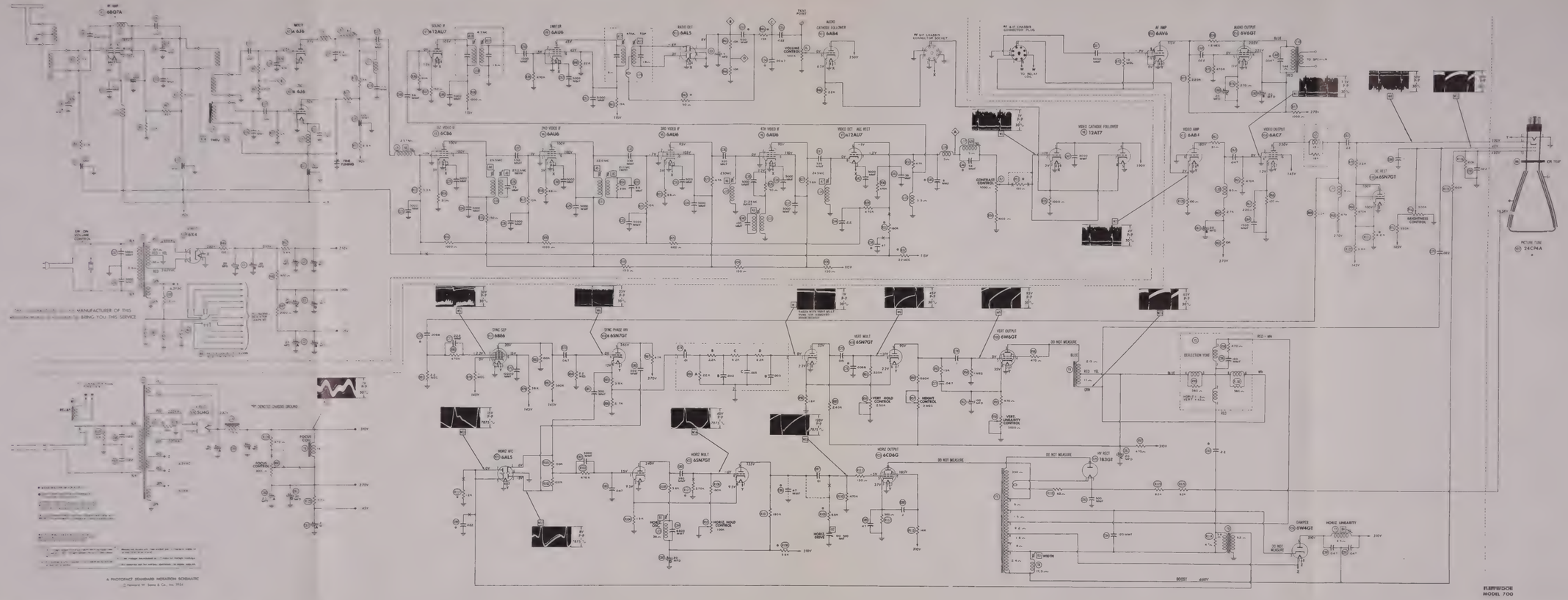

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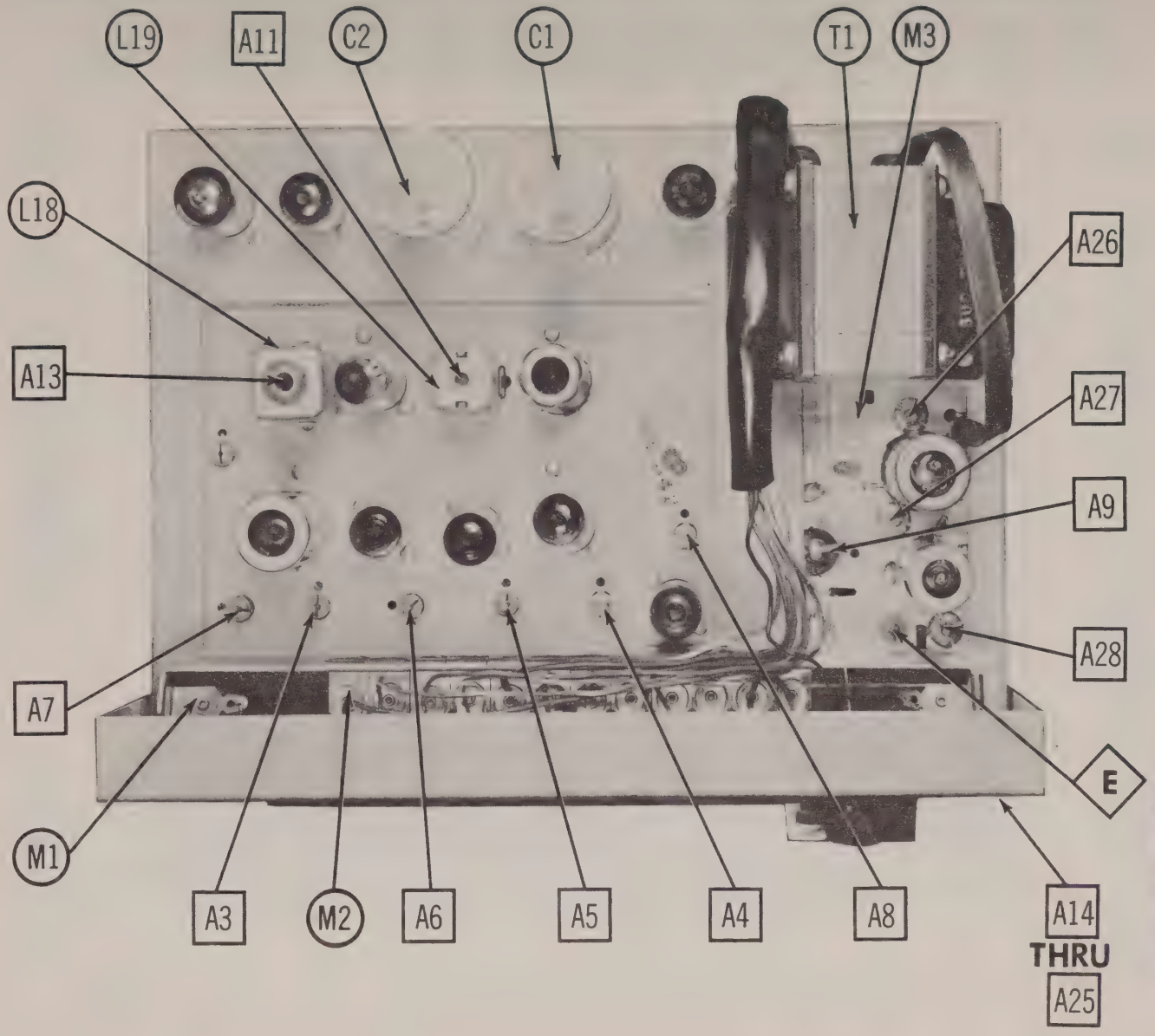

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RF-IF CHASSIS-TOP VIEW

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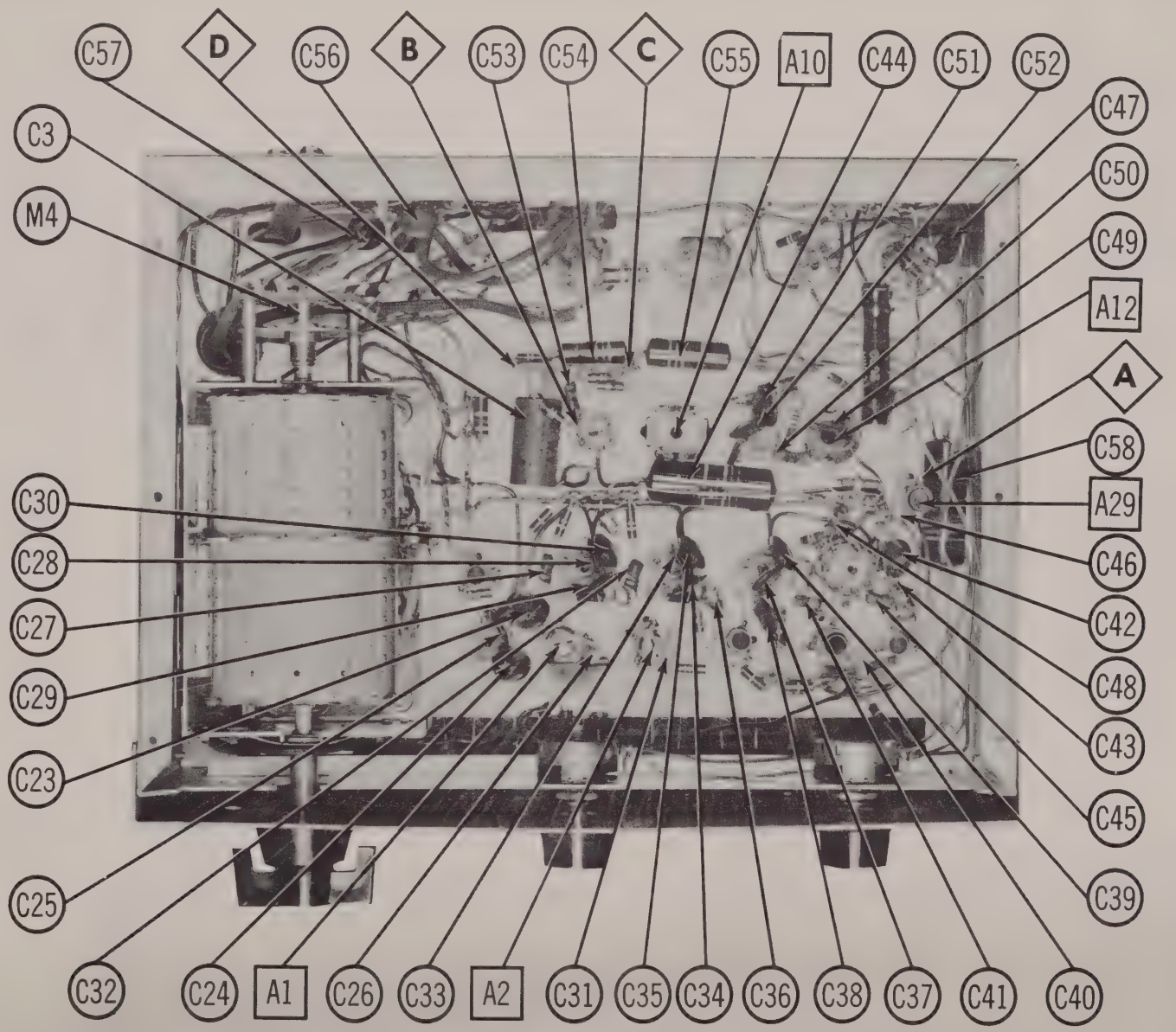
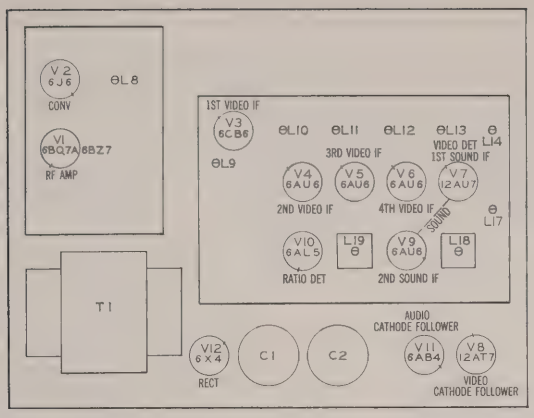


RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



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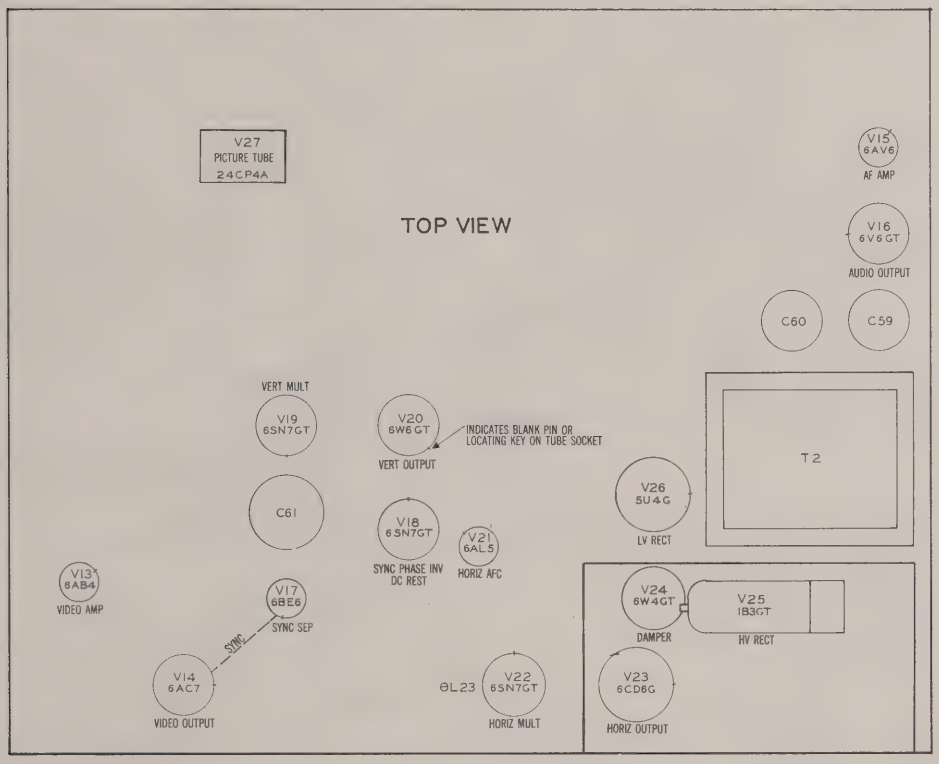

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V12, V26**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V7**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V8, V13, V14, V27**
Has pic, no sound - **V7, V9, V10, V11, V15, V16**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V18, V19**
No horiz. sync - **V18, V21, V22**
No vert. or horiz. sync - **V17, V18**

SWEEP FAILURE
No raster, has sound - **V22, V23, V24, V25, V27**
No vertical deflection - **V19, V20**
Poor vert. linearity or foldover - **V19, V20**
Poor horiz. linearity or foldover - **V22, V23, V24**
Narrow picture - **V22, V23, V24, V25, V26**
Vert. off freq. - **V18, V19**
Horiz. off freq. - **V18, V21, V22**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt bias supply to the ungrounded side of C44. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	27.25MC (Unmod)	Any	DC probe to point ◇A◇. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	21.1MC	"	"	A2	"
3.	"	"	21.25MC	"	"	A3	"
4.	"	"	25.5MC	"	"	A4	Adjust for maximum deflection. Attenuate generator output to maintain not more than -1.5 volts at VTVM.
5.	"	"	22.0MC	"	"	A5	"
6.	"	"	23.0MC	"	"	A6	"
7.	"	"	24.5MC	"	"	A7	"
8.	"	"	23.7MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.1MC 21.2MC 22.0MC 23.7MC 25.75MC 27.25MC	Any	Vert. Amp. thru 10KΩ to point ◇A◇. Low side to chassis.	A9	Check for response similar to Fig. 1. Adjust A9 until dip in response curve is centered about the 23.7MC marker. If necessary, retouch A4 thru A8 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 2 (grid) of 12AU7 (V7). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point ◇B◇. Common to chassis.	A10, A11 A12	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point ◇C◇. Common to point ◇D◇.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to pin 2 (grid) of 12AU7 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point ◇B◇. Low side to chassis.	A10, A11, A12	Disconnect stabilizer capacitor C3. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
11.	"	"	"	"	"	Vert. Amp. to point ◇C◇. Low side to chassis.	A13	Reconnect stabilizing capacitor C3. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

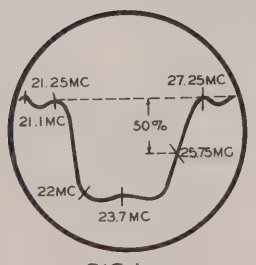

FIG. 1

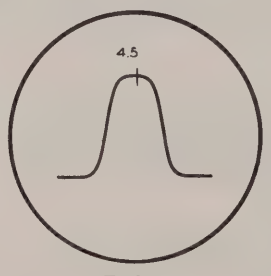

FIG. 2

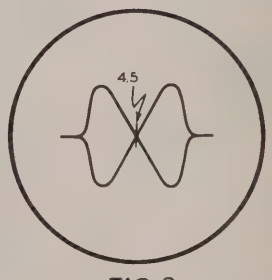

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Leave the bias connected as under "Video IF Alignment".
The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (A) Low side to chassis.	A14	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			213MC (10MC Swp)	211.25MC 215.75MC	13		A15	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A16	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A17	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A18	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A19	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A20	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A21	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A22	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A23	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A24	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A25	

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RF AND MIXER ALIGNMENT

Leave bias connected as under "Video IF alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. to point (E). Low side to chassis.	A26,A27 A28	Adjust for response curve similar to Fig. 5. with markers above 90%.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel make compromise adjustment of A26, A27 and A28 with channel switch set to that channel then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

4.5MC TRAP ALIGNMENT

Tune in a TV station and turn the fine tuning control counter clockwise until 4.5MC beat interference appears in the picture. Adjust A29 for MINIMUM 4.5MC beat interference.

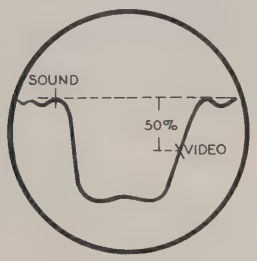


FIG.4

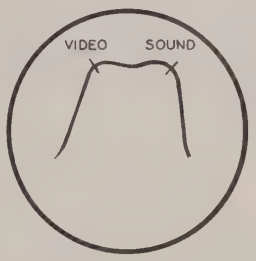
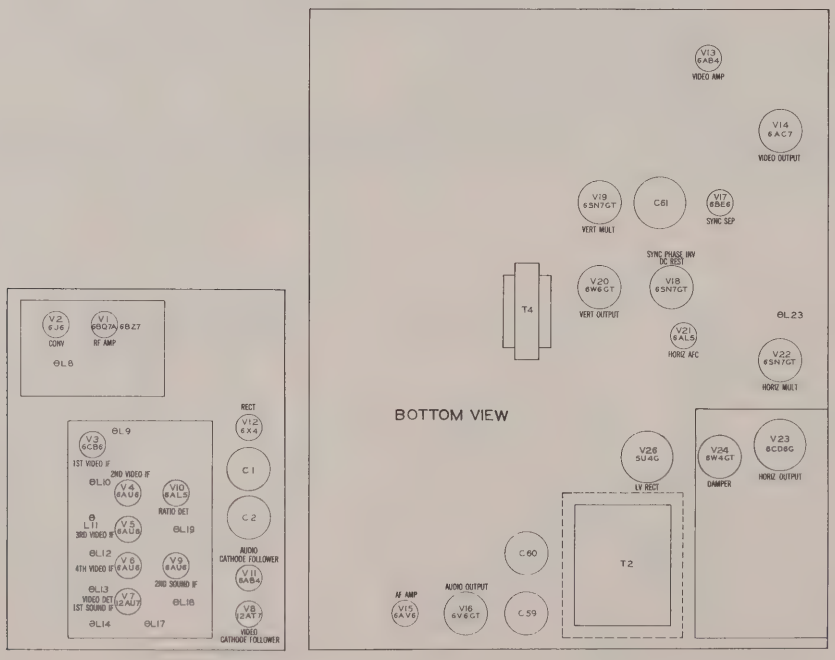


FIG.5

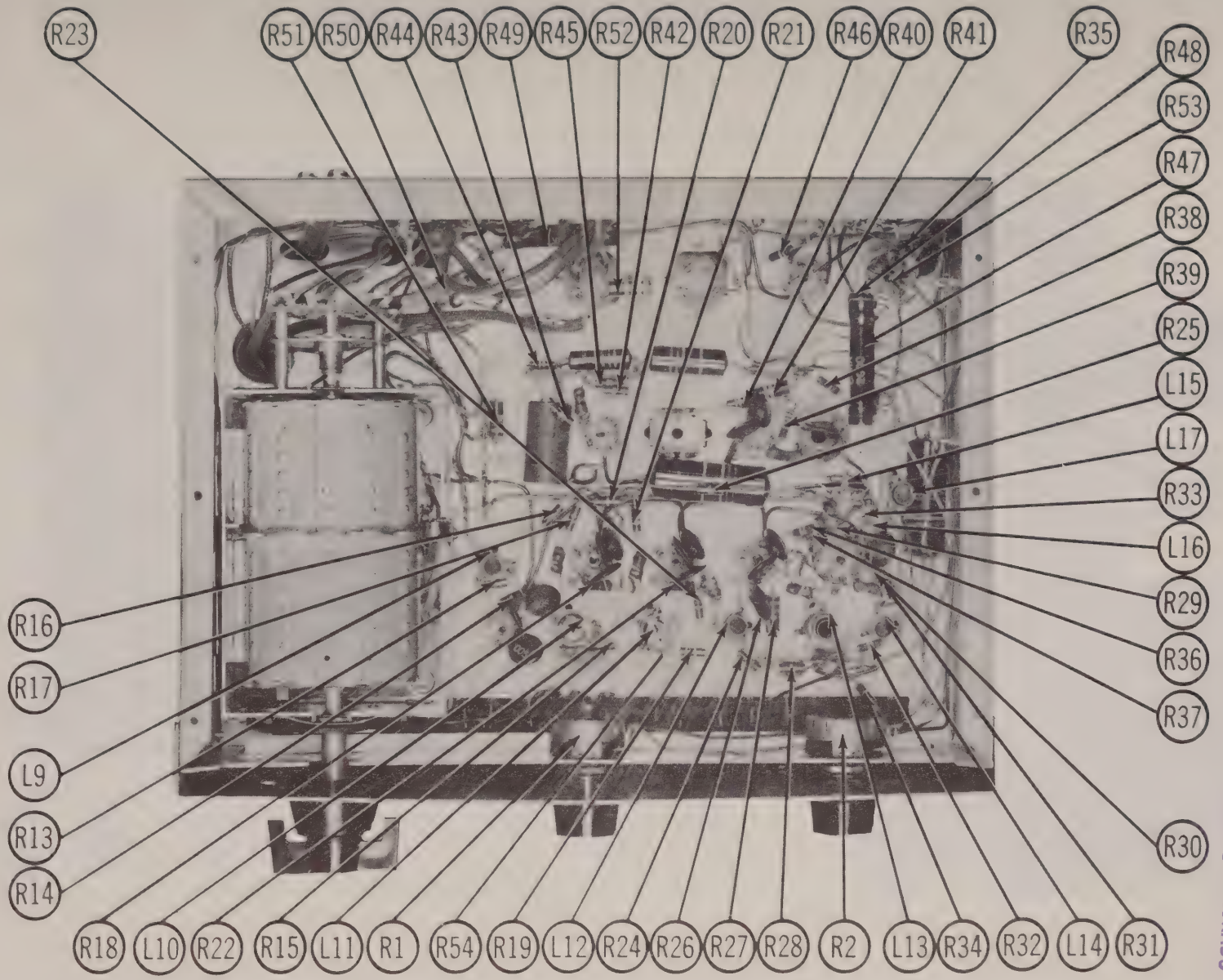
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	700KΩ	0Ω	0Ω	.1Ω	†1.4KΩ	130KΩ	INF	0Ω
V 2	6J6	†23KΩ	†23KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	950KΩ	51Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 4	6AU6	950KΩ	0Ω	.1Ω	0Ω	†3.4KΩ	†3.4KΩ	68Ω		
V 5	6AU6	950KΩ	0Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	68Ω		
V 6	6AU6	.5Ω	0Ω	.1Ω	0Ω	†8.7KΩ	†3.1KΩ	150Ω		
V 7	12AU7	†4KΩ	100KΩ	150Ω	.1Ω	.1Ω	470KΩ	4.7KΩ	.5Ω	0Ω
V 8	12AT7	†950Ω	3KΩ	1KΩ	0Ω	0Ω	†950Ω	3KΩ	1KΩ	.1Ω
V 9	6AU6	470KΩ	0Ω	.1Ω	0Ω	†18KΩ	†18KΩ	0Ω		
V 10	6AL5	INF	INF	0Ω	.1Ω	0Ω	0Ω	20KΩ		
V 11	6AB4	†3.9KΩ	INF	.1Ω	0Ω	INF	250KΩ	22KΩ		
V 12	6X4	137Ω	INF	.1Ω	0Ω	INF	130Ω	40KΩ		
V 13	6AB4	▲13.4KΩ	INF	0Ω	.1Ω	INF	0Ω	100Ω		
V 14	6AC7	0Ω	0Ω	0Ω	470KΩ	120Ω	▲8.2KΩ	.1Ω	▲5.4KΩ	
V 15	6AV6	10Meg	0Ω	.1Ω	0Ω	0Ω	0Ω	▲220KΩ		
V 16	6V6GT	0Ω	0Ω	▲2.2KΩ	▲1.7KΩ	470KΩ	INF	.1Ω	270Ω	
V 17	6BE6	1Meg	0Ω	.1Ω	0Ω	100KΩ	▲47KΩ	2.7Meg		
V 18	6SN7GT	480KΩ	480KΩ	▲12KΩ	2.2Meg	▲5.4KΩ	6.6KΩ	.1Ω	0Ω	
V 19	6SN7GT	60KΩ	▲240KΩ	1.8KΩ	450KΩ	▲1.1Meg	1.8KΩ	.1Ω	0Ω	
V 20	6W6GT	INF	.1Ω	▲750Ω	▲1.2KΩ	1Meg	INF	0Ω	1.1KΩ	
V 21	6AL5	INF	INF	.1Ω	0Ω	9Ω	0Ω	9Ω		
V 22	6SN7GT	INF	▲11.3KΩ	1.5KΩ	170KΩ	▲186KΩ	1.5KΩ	.1Ω	0Ω	
V 23	6CD6G	INF	0Ω	300Ω	INF	470KΩ	INF	.1Ω	▲14KΩ	TOP CAP ⏢8Ω
V 24	6W4GT	INF	INF	200KΩ	INF	▲82Ω	INF	⏢11Ω	⏢11Ω	
V 25	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ⏢360Ω
V 26	5U4G	INF	20KΩ	INF	28Ω	INF	27Ω	INF	20KΩ	
V 27	24CP4	0Ω	▲220KΩ	PIN 10 ▲100KΩ	PIN 11 500KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 7 OF V12
▲ MEASURED FROM PIN 8 OF V26
⏢ MEASURED FROM PIN 3 OF V24



TUBE PLACEMENT CHART



RF-IF CHASSIS-BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

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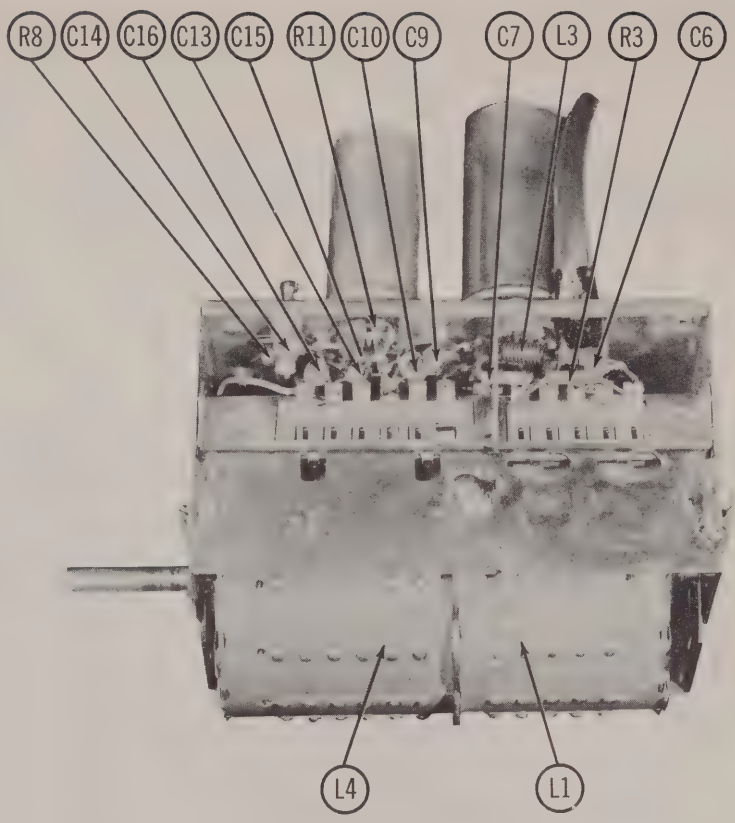
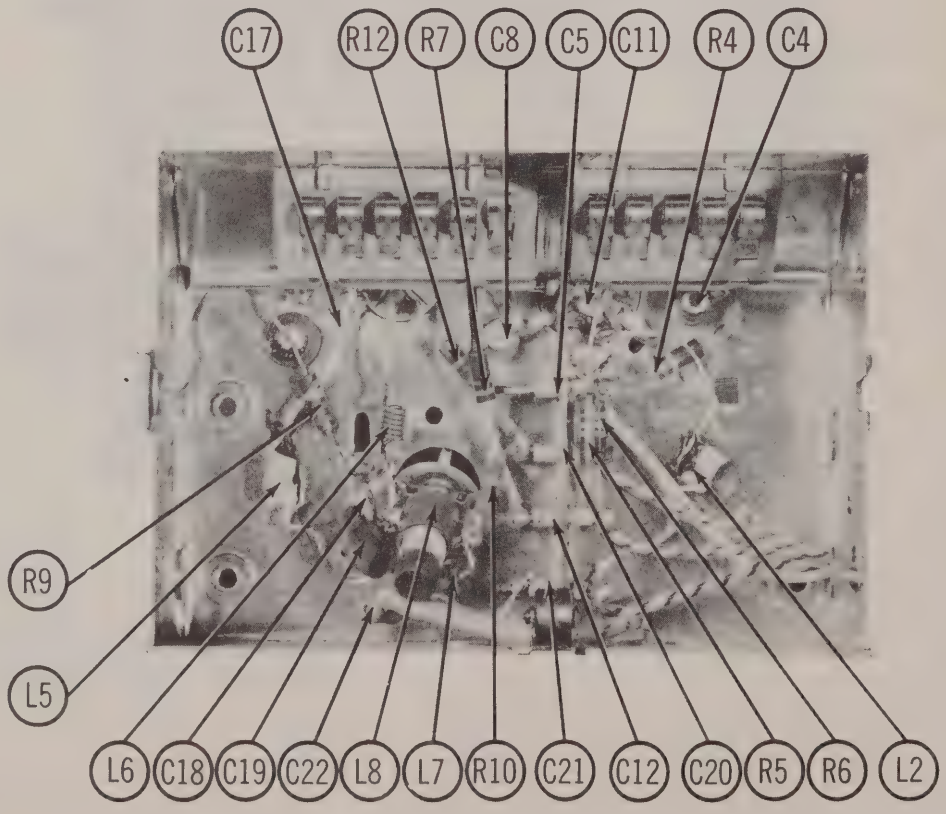


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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[illegible] MEADE ST.
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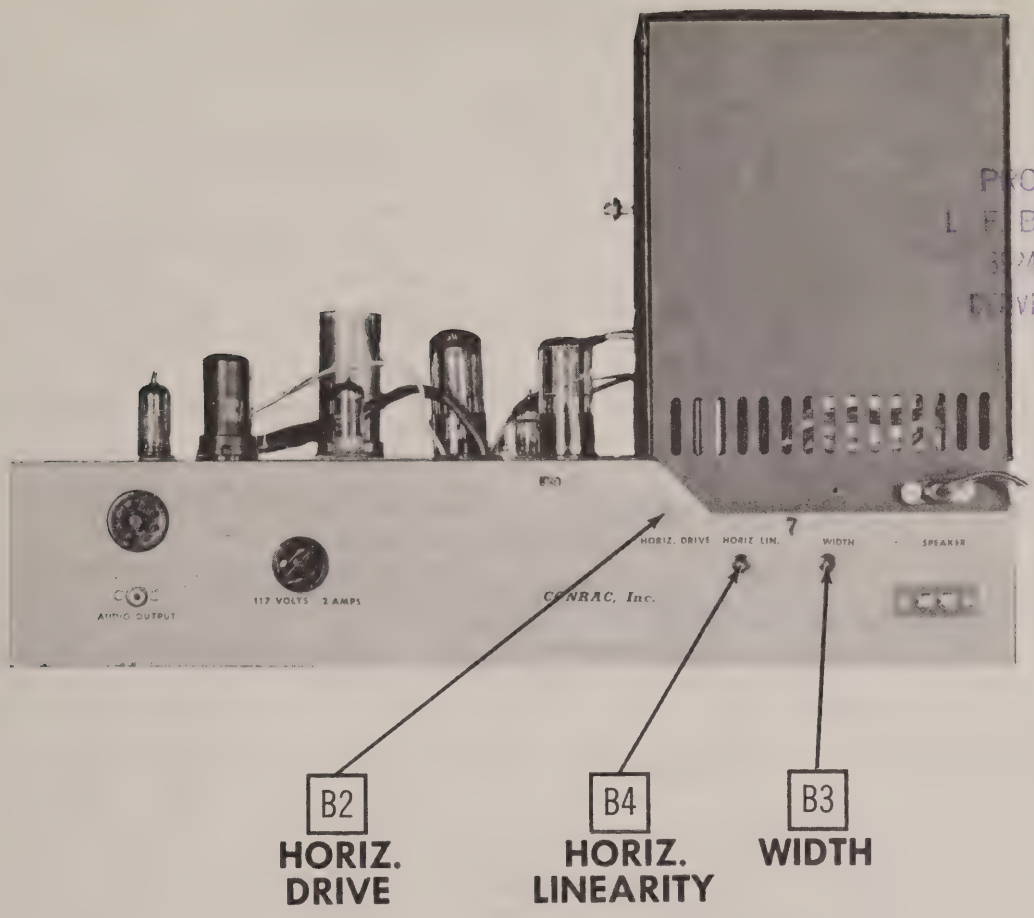


SWEEP CHASSIS—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position.

Ground Pin 1 (grid) of the horizontal multivibrator (V22) to chassis. Adjust the horizontal oscillator slug (B1) until the picture is almost in sync.

Remove the short from Pin 1 of V22. Check pull-in by switching off channel and back again. If necessary, retouch B1 for proper pull-in action.

Turn the horizontal drive trimmer (B2) clockwise as far as possible without the presence of vertical white lines or compression near center of picture or without having the picture fall out of sync horizontally.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V22, V23, V24 and V26. Check adjustments B2, B3, and B4. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check C90, C91, C93, C88, C89, T3, T5A, R112, R113, T3, T5A and other associated circuit components.	Check R107, R108, R109, R110, C85, C86, C87 and other associated components.

DRIVE LINES

Check adjustment B2. Check by substitution V22, V23 and V24. Check T3, T5A, C85, C86, C87, C90, C91, C96, R98, R110, R111 and other associated components.

COMPRESSED LEFT SIDE

Check adjustments B2, B3 and B4. Check by substitution V23 and V24. Check components associated with the horizontal output and damper stages especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check C83 for open. Check V23, V24, T3 and T5A for internal arcing.

XMAS TREE EFFECT

Substitute V22. Check R107, L23, C84, C85 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V19 and V20. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R58, R95 and other associated circuit components.	Check C75, C78, R89, R92, R94, R57, and other associated circuit components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V19 and V20. Check T4, T5B, C62, and other associated components for failure or change of value.

COMPRESSED AT TOP

Check by substitution V19 and V20. Check C75, C76, C77, C78, R93, R94 and other associated circuit components.

FOLDS

Check by substitution V19 and V20. Check components associated with these stages for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V17 and V18. Check components associated with V17 and V18B especially C70, C73, R81, R82, R83, R84, R78 and R79.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Check by substitution V17, V18 and V19. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check R89, R91, R92, C75, C76 and other associated circuit components.	Check vertical integrator and other associated circuit components. Check video and IF stages for overloading.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V21 and V22. Check C84, C85, C86, C80, C81, R107, R106, R101, R102, L23 and other associated circuit components.

HORIZONTAL BENDING

Check by substitution V21, V22 and V23. Check the horizontal AFC filter network for component failure or change of value.

VIDEO

LOSS OF VIDEO

Check by substitution V7, V8, V13, V14 and V18. Check associated components including picture tube and remote connecting cable.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check adjustment A29 and video IF alignment.

POOR CONTRAST

Check by substitution V13, V14, V18, V7 and V8. Check picture tube, contrast control and other associated circuit components.

NEGATIVE PICTURE

Check by substitution V13, V14, V18, V7, V8, V1, V3, V4 and V5. Check AGC network components. Check picture tube and other associated components.

SMEAR

Check by substitution V7, V8, V13, V14 and V18. Check L21, R35, R34, R62, R63, R65, R68, R69, C63, C65, picture tube and other associated circuit compon ents for failure or change of value.

WIDE BLACK BAR ACROSS PICTURE

Check V1, V3, V4, V5, V6, V7, V8, V13, V14 and V18 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V9, V10, V11, V15 and V16. Check stages V11, V15, and V16 using audio signal generator. Apply audio signal across R1.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check R46, R72, R73, R75, R76, R77, C67, C68, T10 and other associated components.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A13 for minimum buzz. If still unsatisfactory substitute V10 and realign audio IF and ratio detector stages. Check C3 for leakage.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

RF-IF CHASSIS

PROPERTY OF
L. F. BLANKENSHIP
3321 MEADE ST.
DENVER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		FLEETWOOD PART No.	STANDARD REPLACEMENT		
V1A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd Video IF Amp.	6AU6	6AU6	7BK	
V6	4th Video IF Amp.	6AU6	6AU6	7BK	
V7	Video Detector-AGC Rectifier-Sound IF Amp.	12AU7	12AU7	9A	
V8	Video Cathode Follower	12AT7	12AT7	9A	
L9	Limiter	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	Audio Cathode Follower	6AB4	6AB4	5CE	
V12	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FLEETWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲20	450		AFH4-14		D013		FP444	TVL-4763	
B	20	450								
C	▲20	450								
D	■20	450								
C2A	▲20	450		AFH4-14		D013		FP444	TVL-4763	
B	20	450								
C	■20	450								
D	▲20	450								
C3	5	50		PRS150/4		BR550		TC30	TVA-1303	
C4	3-8				829-10					
C5	1000			EF-001	MFT-1000				503C-D1	
C6	3			SI3NP0	TCZ-3.3		NP0K-030	ZT-5533	5TCCB-V33	
C7	1000			EF-001	MFT-1000				503C-D1	
C8	.5-3				829-3		3115-01-0R5	CT565A		
C9	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C10	51			BPD-000047	D6-470	G035		UC-5447	5GA-Q47	
C11	1500			BPD-0015	DD-152		801-0015	DC-5215	5HK-D15	
C12	1000			EF-001	MFT-1000				503C-D1	
C13	51			BPD-000047	D6-470	G035		UC-5447	5GA-Q47	
C14	.5-3				829-3		3115-01-0R5	CT565A		
C15	10			SI10NP0	TCZ-10	Z018	NP0K-100	ZT-541	5TCC-Q1	
C16	5									
C17	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C18	3.8			SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C19	73									
C20	1000			EF-001	MFT-1000				503C-D1	
C21	1000			EF-001	MFT-1000				503C-D1	
C22	300			SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	
C23	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C24	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C25	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C26	75			SI75NP0	TCZ-75	TZ27	NP0L-750	ZT-5475	5TCC-Q75	
C27	330			SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C28	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C29	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C30	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C31	68			SI68NP0	TCZ-68	TZ26	NP0L-680	ZT-5468	5TCC-Q68	
C32	330			SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C33	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C34	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C35	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C36	330			SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C37	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C38	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C39	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C40	100			SI100NP0	TCZ-101	TZ30	NP0-333-101	ZT-531	5TCC-T1	
C41	330			SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C42	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C43	56			SI56	D6-560	TP31	GP1K-560	UC-5456	5GA-Q56	
C44	.22	400		P488-22		CUB6P22		PT4025	4TM-P22	
C45	6									Note 1
C46	56			SI56NP0	TCZ-56	TZ24	NP0K-560		5TCC-Q56	Note 2
C47	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C48	56			SI56	D6-560	TP31	GP1K-560	UC-5456	5GA-Q56	
C49	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C50	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C51	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C52	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C53	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	Note 3
C54	.0047	600		P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	Note 4
C55	.022	600		P688-022	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C56	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C57	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C58	.47	200		P288-47		CUB2P47		PT4047	2TM-P47	Note 5

Note 1. Some Models use 5.6MMF in this application.
Note 2. Some Models use 47MMF in this application.
Note 3. Some Models use 330MMF in this application.
Note 4. Some Models use .004MFD in this application.
Note 5. Not used in all Models.

PROPERTY OF
L. F[illegible]NKENSHIP

PARTS LIST AND DESCRIPTIONS (Continued)

SWEEP CHASSIS

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FLEETWOOD PART No	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R1A	500KΩ	1	600R201	Q13-133	A47-500K-S	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	78-1	SWS-12	Not Req.	US-28	Attach to R1A
R2A	500KΩ	1	600R142	Q11-114	A47-500K-S	B-10	U-14	Contrast
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA FLEETWOOD PART No	IRC PART No	NOTES
R3	15KΩ	1		BTS-15K	
R4	47KΩ	1		BTS-47K	
R5	270KΩ	1		BTS-270K	
R6	180KΩ	1		BTS-180K	
R7	470Ω	1		BTS-470	
R8	10KΩ	1		BTS-10K	
R9	220KΩ	1		BTS-220K	
R10	15KΩ	1		BTS-15K	
R11	10KΩ	1		BTS-10K	
R12	15KΩ	1		BTS-15K	
R13	3300Ω 5%	1		BTS-3300 5%	
R14	5Ω 5%	1		BTS-5R 5%	
R15	150Ω	1		BTS-150	
R16	100Ω	1		BTS-100	
R17	10KΩ 5%	1		BTS-10K 5%	
R18	68Ω 5%	1		BTS-68 5%	
R19	150Ω	1		BTS-150	
R20	10mΩ	1		BTS-10M	
R21	17KΩ 5%	1		BTS-10K 5%	
R22	68Ω 5%	1		BTS-68 5%	
R23	4700Ω 5%	1		BTS-4700 5%	
R24	150Ω	1		BTS-150	
R25	100Ω	1		BTS-100	
R26	150Ω	1		BTS-150	
R27	56000Ω 5%	1		BTS-5600 5%	
R28	150Ω	1		BTS-150	

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA FLEETWOOD PART No	IRC PART No	NOTES
R29	470KΩ	1		BTS-470K	
R30	470KΩ	1		BTS-470K	
R31	180KΩ	1		BTS-180K	Note 3
R32	22 Meg	1		BTS-22 Meg	Note 3
R33	4700Ω 5%	1		BTS-4700 5%	
R34	1000Ω	1		BTS-1000	
R35	1000Ω	1		BTS-1000	
R36	100KΩ	1		BTS-100K	
R37	150Ω	1		BTS-150	
R38	1000Ω	1		BTS-1000	
R39	470KΩ	1		BTS-470K	
R40	22KΩ	1		BTS-22K	
R41	15KΩ	1		BTA-15K	
R42	50Ω 5%	1			Note 1
R43	10KΩ	1		BTS-10K	
R44	10KΩ	1		BTS-10K	
R45	15KΩ	1		BTS-15K	Note 3
R46	22KΩ	1		BTS-22K	
R47	2000Ω	10		1 3/4A-2000	
R48	800Ω	10		1 3/4A-800	
R49	150Ω	10		1 3/4A-150	
R50	1.2Ω	1			
R51	6800Ω	1		BTA-6800	
R52	3900Ω	1		BTA-3900	
R53	150Ω	1		BTS-150	Note 3
R54	3900Ω	1		BTS-3900	

Note 1. Some models may use a 270Ω resistor in this application.
Note 2 Some models may use a 22KΩ resistor in this application.
Note 3. Not used in all models.

TRANSFORMER (POWER)

ITEM No	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA FLEETWOOD PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC ⓐ .64A	534VCT ⓐ .07BA	6.3VAC ⓐ 5.1A		P-3148	R-12A①②				

① Drill new mounting holes.
② Tape ⓐ .3 volt center tap.

COILS (RF-IF)

ITEM No.	USE	DC RES PRI	DC RES SEC.	REPLACEMENT DATA FLEETWOOD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coils	90CT	0Ω					
L2	Fil. Choke	0Ω						
L3	Neutr. Coil	0Ω						
L4	RF, Mixer Grid & Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Choke	0Ω						
L7	IF Trap	5Ω						
L8	Conv. Plate	1.1Ω						
L9	1st Video IF	.6Ω			17-1004	TV-103 †	6189 †	
L10	2nd Video IF	1.1Ω					6245	
L11	3rd Video IF	5Ω					6246 ▲	Includes trap
L12	4th Video IF	5Ω			17-1004	TV-103 †	6189 †	Includes trap
L13	Cath-de Trap	0Ω	0Ω		20-1021 †	TV-150 †	6193 †	
L14	5th Video IF	5Ω			17-1003	TV-103 †	6188 †	
L15	Shunt Peaking Coil	3.5Ω			19-3036	TV-180	6176	35 Microhenries
L16	Series Peaking Coil	5Ω			19-3075		6172	70 Microhenries
L17	4.5MC Trap	1.5Ω			20-1004	TV-151	1470	
L18	Sound IF	8Ω	1.8Ω		16-3445	TV-113 ●	6203 ●	
L19	Ratio Detector	6Ω	1.9ΩCT		17-3497	TV-115	6205	Tertiary windlg., 7Ω

† Enlarge mounting hole.
▲ Add 3900Ω resistor across trap winding.
● Use adaptor plate.

MISCELLANEOUS

ITEM No	PART NAME	FLEETWOOD PART No.	NOTES
M1	Dial light		# 44- 2 used
M2	Dial light		# 44- station indicators-13 used
M3	Tuner		VHF standard
M4	Switch		Station light selector

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA FLEETWOOD PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V13	Video Amplifier	6AB4	6AB4	5CE	
V14	Video Output	6AC7	6AC7	8N	
V15	AF Amplifier	6AV6	6AV6	7BT	
V16	Audio Output	6W6GT	6W6GT	7B	
V17	Sync Separator	6BE6	6BE6	7CH	
V18	Sync Phase Inv. - DC Restorer	6SN7GT	6SN7GT	8BD	
V19	Vertical Mult.	6SN7GT	6SN7GT	8BD	
V20	Vertical Output	6W6GT	6W6GT	7B	
V21	Horizontal AFC	6AL5	6AL5	6BT	
V22	Horizontal Mult	6SN7GT	6SN7GT	8BD	
V23	Horizontal Output	6CD6G	6CD6G	5BT	
V24	Damper	6W6GT	6W6GT	7B	
V25	HV Rectifier	1B3GT	1B3GT	2C	
V26	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA FLEETWOOD PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V27	24CP4A	24CP4A ①	24CP4A ①	24CP4A ①		12N	① Aluminized
				24CP4		12N	
		24TP4 ①		24TP4 ①		12N	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FLEETWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C59A	▲40	475		AFH2-T2		B053		FP262	TVL-2839	
B	▲40	475								
C60A	▲20	450		AFH4-67		D052		FP444	TVL-4763	
B	▲20	450								
C	20	25								
D	■20	450								
C61A	▲20	450		AFH4-14		D013		FP444	TVL-4763	
B	■20	450								
C	▲20	450								
D	20	450								
C62	100	50		PRS50/100		BRH501		TC3501	TVA-1310	
C63	.047	600	73P47306	P688-047	DF-503	CUB6315		PT6147	6TM-S47	
C64	1500	500		1467-0015	D6-153	JW50Lb	GP2L-153	MC255	1FM-315	
C65	.22	600		P488-22		CUB4P22		PT4025	4TM-P22	
C66	.1	600	73P1046	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C67	5000		29C1	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	
C68	.022	600	73P22306	P688-022	DF-203	CUB6822	817-02	PT6122	6TM-S22	
C69	.0047	600	73P47206	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	Note 4
C70	.0068	600	73P68206	P688-0068	D6-682	CUB6D68	GP2-333-682	PT6268	6TM-D68	Note 6
C71	220	500		1468-00025	D6-221	5W5T22	GP2K-221	MC240	1FM-325	
C72	10000		36C1	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C73	.047	600	73P47306	P688-047	DF-503	CUB6847		PT6147	6TM-S47	
C74A	.01					CUB681	GP2-333-103	PT611		
B	.002			ePA-111	ePC-101	CUB6D2	GP2-333-202	PT622	e106C1	
C	.005					CUB6D5	GP2-333-502	PT625		
D	.005					CUB6D5	GP2-333-502	PT625		
C75	.015	600	73P15306	P688-015		CUB6315		PT6115	6TM-S15	
C76	.0068	600	73P68206	P688-0068	D6-682	CUB6D68	GP2-333-682	PT6268	6TM-D68	Note 6
C77	.047	600	73P47306	P688-047	DF-503	CUB6847		PT6147	6TM-S47	
C78	.1	600	73P1046	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C79	.022	600	73P22306	P688-022	DF-203	CUB6822	817-02	PT6122	6TM-S22	
C80	500	500		1468-0005	D6-501	5W5T5	GP2K-501	MC245	1FM-35	
C81	500	500		1468-0005	D6-501	5W5T5	GP2K-501	MC245	1FM-35	
C82	5000		29C1	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	
C83	.047	600	73P47306	P688-047	DF-503	CUB6847		PT6147	6TM-S47	
C84	6800	500						MCB468		
C85	390	500		1469-0004		5R5T39		MCB243	M8-34	
C86	47									
C87	.01	600	73P1006	P688-01	D6-103	CUB631	GP2-333-103	PT611	6TM-S1	
C88	.1	600	73P1606	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C89	.47	200	67P47402	P288-47		CUB23P47		PT2447	2TM-P47	
C90	.047	600	73P47306	P688-047		CUB6S47		PT6147	6TM-S47	
C91	.047	600	73P47306	P688-047		CUB6S47		PT6147	6TM-S47	
C92	500	20000		HV20C	TV3-502	MMU20T5	413	HV20035A	20DK-T5	
C93	.22	400	67P22404	P488-22		CUB4P22		PT4025	4TM-P22	Note 7
C94	120	3000							30CA-T12	
C95	.022	600	73P22306	P688-022	DF-203	CUB6822		PT6122	6TM-S22	
C96	100	2500					3KV-101		30CA-T1	
C97	.022	600	73P22306	P688-022		CUB6822		PT6122	6TM-S22	
C98	.022	600	73P22306	P688-022		CUB6822		PT6122	6TM-S22	
C99	.022	600	73P22306	P688-022		CUB6822		PT6122	6TM-S22	Note 5

Note 4. Some models use .004MFD in this application.
Note 5. Not used in all Models.
Note 6. Some Models use .006MFD in this application.
Note 7. Some Models use .1MFD in this application.
● Items C74A, C74B, C74C, C74D, R88A, R88B, R88C, R88D are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FLEETWOOD PART No	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R55A	100KΩ	1	460-R54	Q11-128	A47-100K-S	AB-60	SU-41	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R55A
R5CA	500KΩ	1	600R112	Q11-133	A47-500K-S	AD-59	SU-50	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5CA
R57A	2 Meg	1	460-R50	Q11-132	A47-2Meg-S	AD-75	SU-56	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R57A
R58A	3000Ω	2	460-R71	WK-3000	VK-133	A43-3000	R3000L	Vert. Linearity
B	Shaft		Not Req.	Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R58A
R59A	250KΩ	1	460-R69	Q11-130	A47-250K-S	AB-50	SU-46	Vert. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R59A
R60A	3000Ω	4	460-R305	AW-3000	AW-3000	AU-3000	SUP-988	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R60A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FLEETWOOD PART No.	IRC PART No.	NOTES
R61	5Ω 5%	1		BTS-5 1 5%	
R62	2700Ω 5%	1		BTS-2700 5%	
R63	10KΩ	1		BTA-10K	
R64	470KΩ	1		BTS-470K	
R65	470KΩ	1		BTS-470K	
R66	120Ω	1		BTS-120	
R67	220Ω	1		BTS-220	
R68	4700Ω 5%	2		BTB-4700 5%	
R69	22KΩ	1		BTS-22K	
R70	22KΩ	1		BTS-22K	
R71	330KΩ	1		BTS-330K	
R72	10 Meg	1		BTS-10 Meg	
R73	220KΩ	1		BTS-220K	
R74	1.2 Meg	1		BTS-1.2 Meg	
R75	470KΩ	1		BTS-470K	
R76	270Ω	1		BTS-270	
R77	1000Ω	2		BTB-1000	
R78	1 Meg	1		BTS-1 Meg	
R79	39KΩ	1		BTS-39K	
R80	470KΩ	1		BTS-470K	
R81	2.2 Meg	1		BTS-2.2 Meg	
R82	390KΩ	1		BTS-390K	
R83	100KΩ	1		BTS-100K	
R84	2.2 Meg	1		BTS-2.2 Meg	
R85	3900Ω	1		BTS-3900	
R86	2700Ω	1		BTS-2700	
R87	4700Ω 5%	1		BTS-4700 5%	
R88A	22KΩ	} •		BTS-22K	
B	22KΩ			BTS-22K	
C	6200Ω			BTS-6200	
D	8200Ω			BTS-8200	
R89	240KΩ 5%	1		BTA-240K 5%	
R90	1800Ω	1		BTS-1800	
R91	220KΩ	1		BTS-220K	
R92	680KΩ	1		BTS-680K	
R93	15KΩ	1		BTS-15K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FLEETWOOD PART No.	IRC PART No.	NOTES
R94	1 Meg	1		BTS-1 Meg	
R95	470Ω	1		BTA-470	
R96	470Ω	1		BTS-470	
R97	470Ω	1		BTA-470	
R98	470Ω	1		BTS-470	
R99	56Ω	1		BTS-560	
R100	560Ω	1		BTS-560	
R101	100KΩ	1		BTS-100K	
R102	100KΩ	1		BTS-100K	
R103	470KΩ	1		BTS-470K	
R104	1500Ω 5%	1		BTS-1500 5%	
R105	5600Ω 5%	1		BTS-5600 5%	
R106	180KΩ	1		BTS-180K	
R107	180KΩ	1		BTS-180K	
R108	560Ω	1		BTA-560	Note 4
R109	8800Ω	1		BTS-8800	Note 5
R110	470KΩ	1		BTS-470K	
R111	150Ω	1		BTS-150	
R112	3000Ω	10		1 3/4-300	
R113	14KΩ	10			
R114	4.7Ω	1			
R115	100KΩ	1		BTS-100K	
R116	100KΩ	1		BTS-100K	
R117	1200Ω	1		BTS-1200	Note 6
R118	825Ω	1			
R119	82KΩ	1		BTA-82K	
R120	82KΩ	1		BTA-82K	
R121	8200Ω	2		BTS-8200	Note 7
R122	3900Ω	2		BTB-3900	
R123	7500Ω	10		1 3/4A-7500	
R124	470Ω	1		BTA-470	
R125	100KΩ	1		BTS-100K	
R126	10Ω	1			
R127	270KΩ	1		BTS-270K	Note 6
R128	100Ω	1		BTS-100	

Note 4. Some Models may use a 10KΩ resistor in this application.
Note 5. Some Models may use a 4700Ω resistor in this application.
Note 6. Not used in all models.
Note 7. Some Models may use a 5.8KΩ resistor in this application.
• Items R88A, R88B, R88C, R88D, C74A, C74B, C74C, C74D are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA FLEETWOOD PART No	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	117VAC a 1.8A	640VCT ..40ADC	5VAC a 2A		P-8166① ②	P-3070	R-59BC		P979 3	26R21
	SEC. 3	SEC. 4	SEC. 5							
	③ 2.5VAC ⑤ 1.2A	④ 6.3VAC ⑤ 7.1A								

① Drill new mounting holes.
② Parallel and phase 6.3V 5A windings for Sec. # 4.
③ Tape 5V 2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA FLEETWOOD PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T3	Horiz. Output Trans.	T40			D-50 •	2357 1 •		FLY-16*
T4	Vert. Output Trans.		A-8142①②	A-3038②	A-108X		Z1803②	T-28353②
T5A	Yoke (90°) - Horiz. (12MH)							
B	Yoke (90°) - Vert. (43MH)			MDF-90③	Y-50-1	219D1①		Y-14
T6	Focus Coil							
T7	Horiz. Lin. Coil (1.3-10MH)		WC-8	MWC-6④	WC-12⑤	2 13R1		WC-17
T8	Width Coil (2.5-23MH)		WC-5⑤⑥	MWC-1④ ⑥	WC-13⑤	215R1	RF800	WC-18④
T9	Horiz. AFC Trans. (Pri.-78 MH)	797						
	Horiz. AFC Trans. (Sec.- 2.9MH)							

① Drill new mounting holes.
② Connect an auto transformer.
③ Use original yoke network.
④ Enlarge mounting hole.
⑤ Connect to coded red and blue terminals.

FLEETWOOD MODEL 700

PARTS LIST AND DESCRIPTIONS (Continued)

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
	9			9	9		9
	7			7	7		7
	5			5	5		5
	4 (NC)			4 (NC)	4 (NC)		4 (NC)
	T			T	T		T
	3			3	3		3
	1			1	1		1
Connect Width Coil Across ▬▬▶	3 & 1			3 & 1	3 & 1		3 & 1
Special Notes →							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FLEETWOOD PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T10	7.8KΩ	3Ω-4Ω	2073	A-8114 ①	A-3020	S-8X ①	Z1113 ①	TS-24S52	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FLEETWOOD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L20	Shunt Peaking Coil	6.5Ω			19-3093	TV-181	6177	93 Microhenries
L21	Series Peak. Coil	13Ω			19-4200	TV-185 *	6154 *	215 Microhenries; wound on 18KΩ resistor
L22	Shunt Peaking Coil	19Ω			19-3500	TV-188	6174	450 Microhenries
L23	Horiz. Osc.	38Ω			19-1575	TV-163 †	6210 †	

† Enlarge mounting hole.
* Parallel with 18KΩ resistor.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	FLEETWOOD PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L24	.240ADC	74.5Ω	2.88HY		C-2334 ①	C-2991	C-17X ②	C5030	20C55 ①

① Remount if necessary to move to new location.
② Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	FLEETWOOD PART No.	NOTES
M5	Relay		6 VAC, SPST
M6	Ion trap		Single field, 50 gauss
B2	Trimmer cap	304	100-500MMF (Horiz. Drive)

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If all filaments fail to light, check AC cord on tuner, switch on volume control and T1. If sweep chassis filaments fail to light, check power cable, T2 and relay M5. If filaments light, check by substitution V26. Check sweep chassis B+ filter and decoupling components.

SMALL AND/OR DIM PICTURE

Substitute V26. Check sweep chassis B+ filter and decoupling components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V22, V23, V24 and V25. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check R118, R119, R120, R113, R112, C92, C88, T3, T5A and other associated circuit components.	Check C85, C86, C87, R104, R105, R107, R110 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V22, V23, V24, V25 and V26. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V22, V23, V24, V25 and V26. Check T3, T5A, R118, R119, R120, R113, C92, C88 and other associated circuit components.

GENERAL

RASTER SOUND NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6, V7 and V12. Check associated circuit components.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

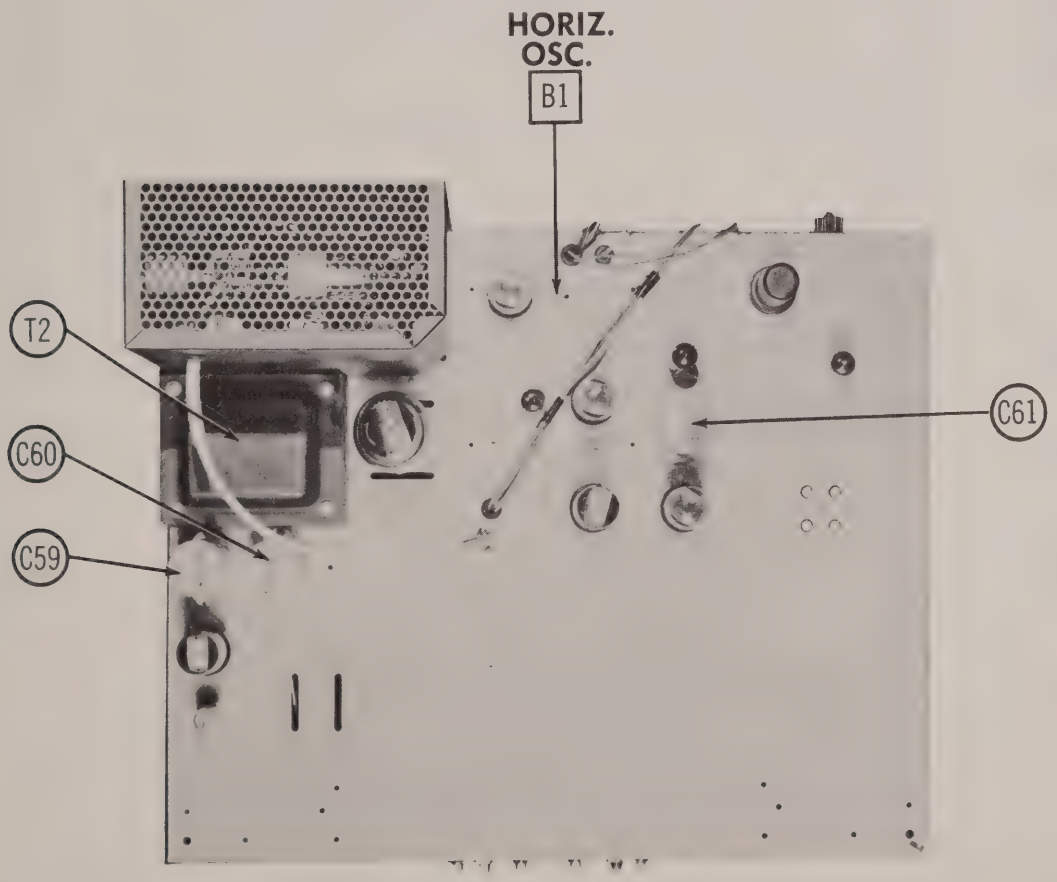
KEYSTONE EFFECT

Check T5, R98, R99, R100 and C96.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

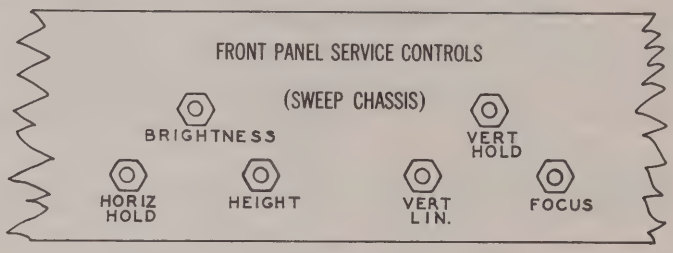


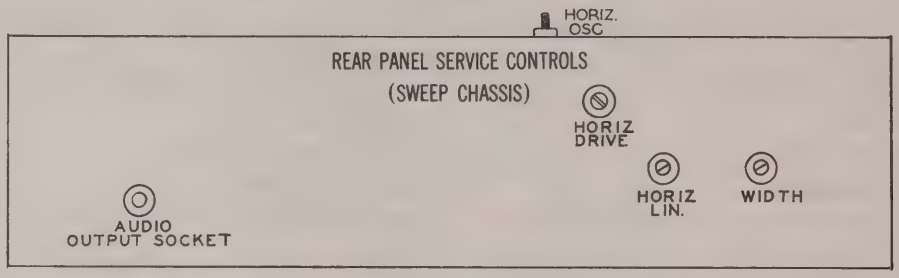
SWEEP CHASSIS TOP VIEW

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

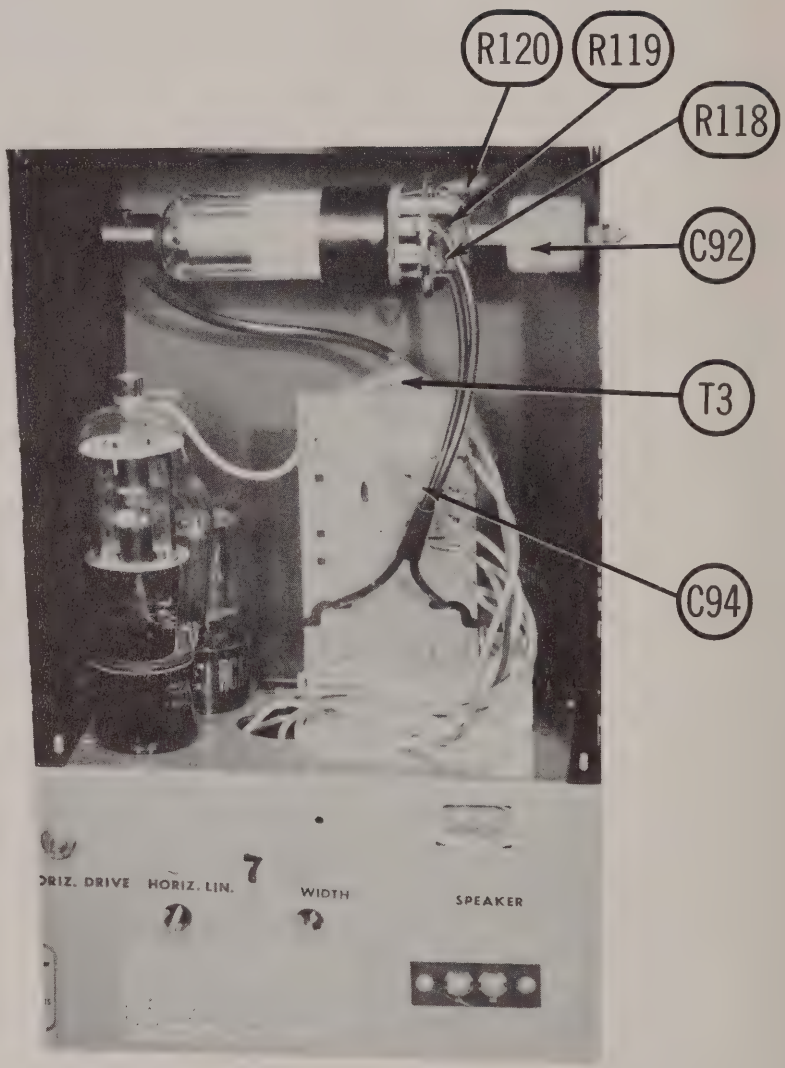
Adjustment of the Horizontal Oscillator Circuit can be made from the rear panel of the Sweep chassis. Set the Horizontal Hold Control at the Mid-position of its range and adjust the Horizontal Frequency slug L 23 until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L19 located on top of chassis. (See tube placement chart).

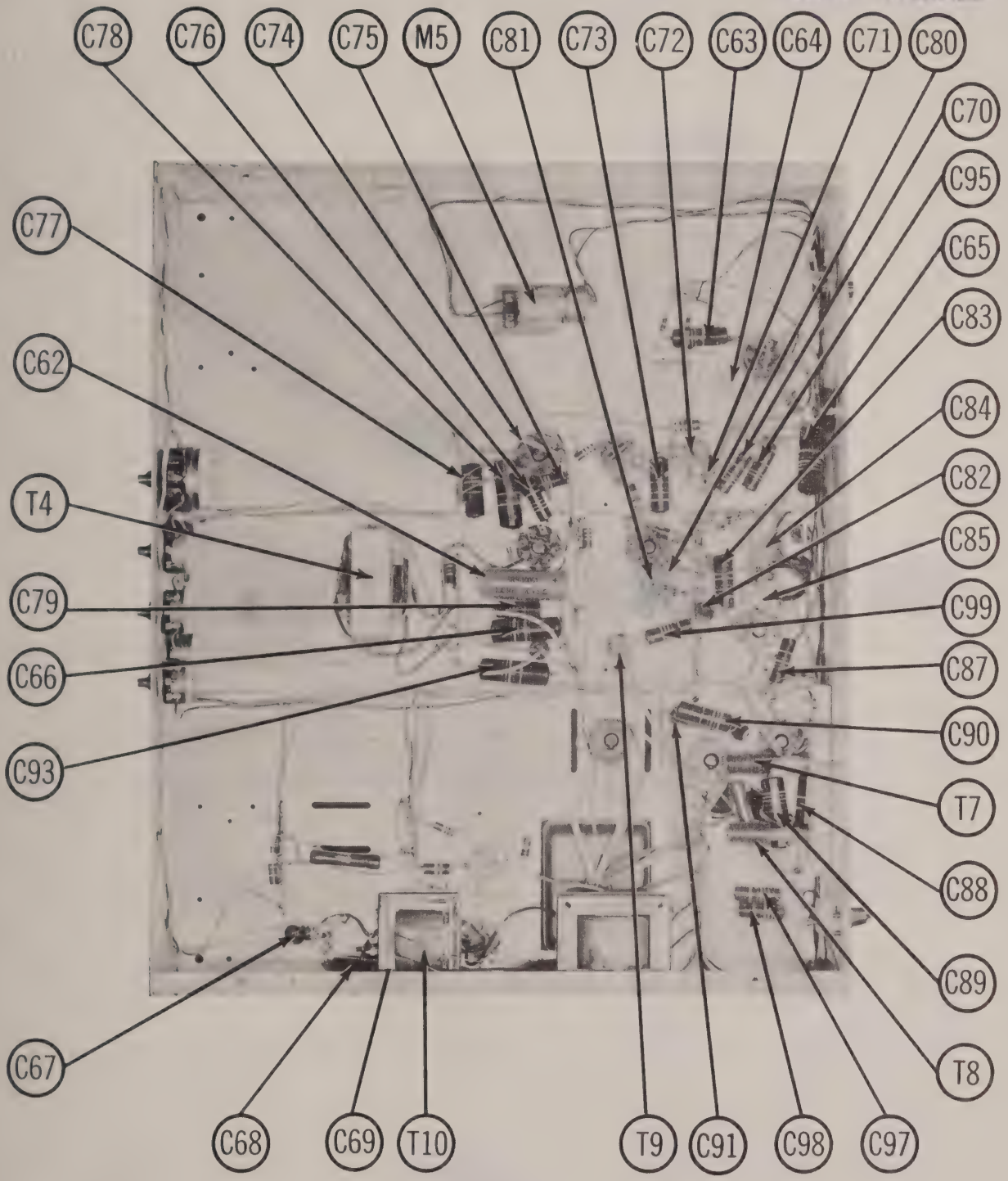
CENTERING

Centering is accomplished mechancally by positioning the focus coil. The focus coil is mounted on a shelf with one wind nut and is adjustable laterally, the shelf itself is supported by two wing nuts and is adjustable vertically. These adjustments permits the picture to be properly centered.

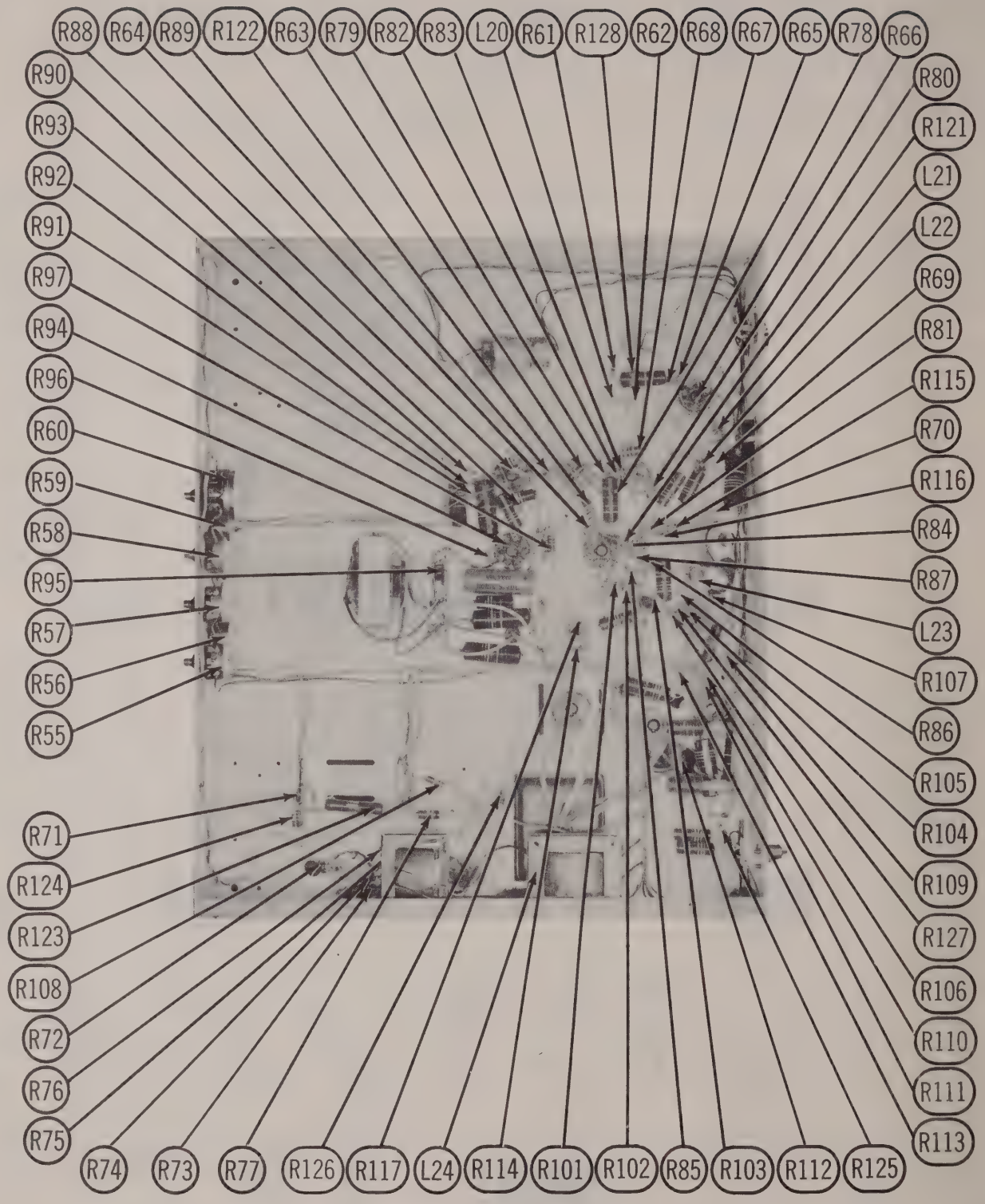


HIGH VOLTAGE COMPARTMENT

PROPERTY OF
L. P. BLANKENSHIP
[illegible] MEADE ST.
DENVER, COLORADO

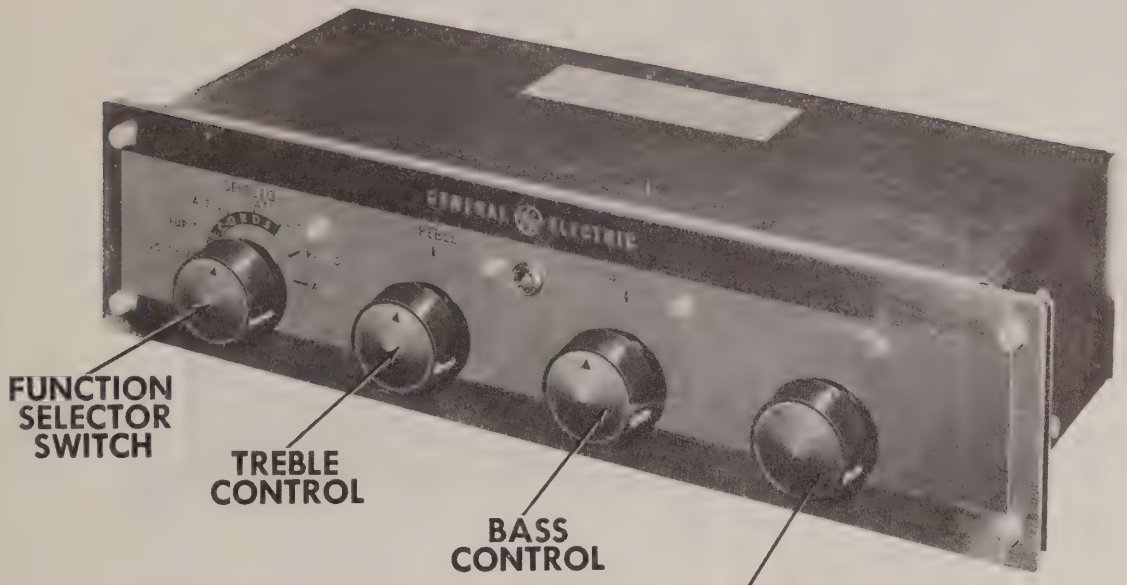


SWEEP CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



SWEEP CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

GENERAL ELECTRIC
MODEL A1-200



GENERAL ELECTRIC
MODEL A1-200

TRADE NAME	General Electric Model A1-200
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N.Y.
TYPE SET	AC Operated Three Channel Pre-Amplifier & Control Unit
TUBES (Three)	Types 6SC7 Pre-Amp.-Equalizer, 12AX7 Cath. Follower-AF Amp., 12AU7 AF Amp.
POWER SUPPLY	105-120 Volts AC RATING .14 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

GENERAL ELECTRIC
MODEL A1-200

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		General Electric PART No.	STANDARD REPLACEMENT		
V1	Pre Amp-Equalizer	6SC7	6SC7	8S	
V2	Cath. Follower-AF Amplifier	12AX7	12AX7	9A	
V3	AF Amplifier	12AU7	12AU7	9A	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

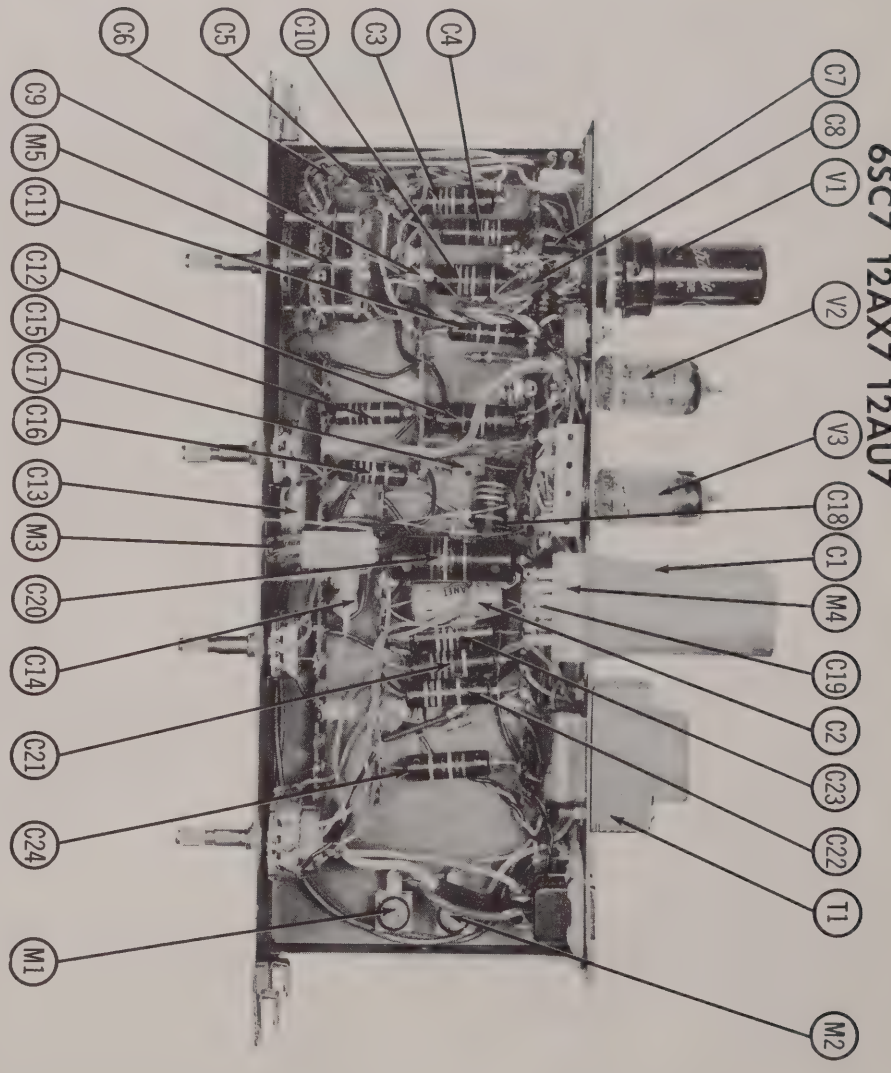
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲60	300	RCE-165	AFH4-93		D092		FP428.4	TVL-4720	
B	▲30	250								
C	■30	250								
C2	25	25	RCE-086	PRS25/25		BR252		TC26	TVA-1205	
C3	.047	200	RCN-014	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C4	.047	200	RCN-014	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C5	.004	400	RCC-118	P688-004	D6-402	CUB6D4	GP2-333-402	PT624	6TM-D4	
C6	.004	400	RCC-118	P688-004	D6-402	CUB6D4	GP2-333-402	PT624	6TM-D4	Note 1
C7	.047	400	RCN-014	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C8	750	500	RCU-313	1464-00075		IR5T75				
C9	1000		RCW-3099	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C10	.047	400	RCN-014	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C11	.01	400	RCN-018	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C12	.1	200	RCN-031	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C13	.006	200	RCN-076							
C14	.06	200	RCC-109							
C15	.0033	400	RCN-075							
C16	.015	200	RCN-042							
C17	100	500	UCU-1028	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C18	.047	400	RCN-014	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C19	270	500	UCU-1038			5R5T27				
C20	.15	400	RCN-074	P488-15		CUB4P15		PT4015	4TM-P15	
C21	.022	400	RCN-050	P488-022		CUB4S22		PT4122	4TM-S22	
C22	.022	400	RCN-050	P488-022		CUB4S22		PT4122	4TM-S22	
C23	.047	400	RCN-014	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C24	.01	600	RCN-018	689ZX-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	

Note 1. Not used in all Models.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	General Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	250KΩ	½	RRC-230		AT-44			Loudness tapped @ 6K-8K
B	Shaft		Not Req.		KSS-3			Attach to R1A
C	Switch		Not Req.		SWA			Attach to R1A
R2A	500KΩ	½	RRC-229	Q13-133	A47-500K-Z	BSK-60	U-48	Bass
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	RRC-229	Q13-133	A47-500K-Z	BSK-60	U-48	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R3A
R4	500KΩ	½	RRC-228					Gain
R5	100Ω	1	RRC-231		39-100			Hum balance-wire wound

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R6	62KΩ	½	URD-1092	BTS-62K	
R7	3.3Meg	½	URD-133	BTS-3.3Meg	
R8	100KΩ	½	RUD-097	BTS-100K	
R9	3.3Meg	½	URD-133	BTS-3.3Meg	
R10	470KΩ	½	URD-113	BTS-470K	
R11	470KΩ	½	URD-113	BTS-470K	
R12	270KΩ	½	URD-107	BTS-270K	
R13	470KΩ	½	URD-113	BTS-470K	
R14	470KΩ	½	URD-113	BTS-470K	
R15	240KΩ	½	URD-1106	BTS-240K	
R16	240KΩ	½	URD-1106	BTS-240K	
R17	3900Ω	½	URD-063	BTS-3900	
R18	6800Ω	½	URD-069	BTS-6800	
R19	12KΩ	½	URD-075	BTS-12K	
R20	470KΩ	½	URD-113	BTS-470K	
R21	1000Ω	½	URD-049	BTS-1000	
R22	100KΩ	½	URD-097	BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R23	5600Ω	½	URD-067	BTS-5600	
R24	51KΩ	½	URD-1090	BTS-51K	
R25	5100Ω	½	URD-1066	BTS-5100	
R26	1600Ω	½	URD-1054	BTS-1600	
R27	51KΩ	½	URD-1090	BTS-51	
R28	22KΩ	½	URD-081	BTS-22K	
R29	470KΩ	½	URD-113	BTS-470K	
R30	3300Ω	½	URD-061	BTS-3300	
R31	100KΩ	½	URD-097	BTS-100K	
R32	51KΩ	½	URD-1090	BTS-51K	
R33	15KΩ	½	URD-077	BTS-15K	
R34	15KΩ	½	URD-077	BTS-15K	
R35	100KΩ	½	URD-097	BTS-100K	
R36	470KΩ	½	URD-113	BTS-470K	
R37	3600Ω	½	URD-1062	BTS-3600	
R38	51KΩ	½	URD-1090	BTS-51K	
R39	22KΩ	1		BTA-22K	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	General Electric PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @.14A	290VAC .006ADC	6.3VAC @1.17A		RTP-316					

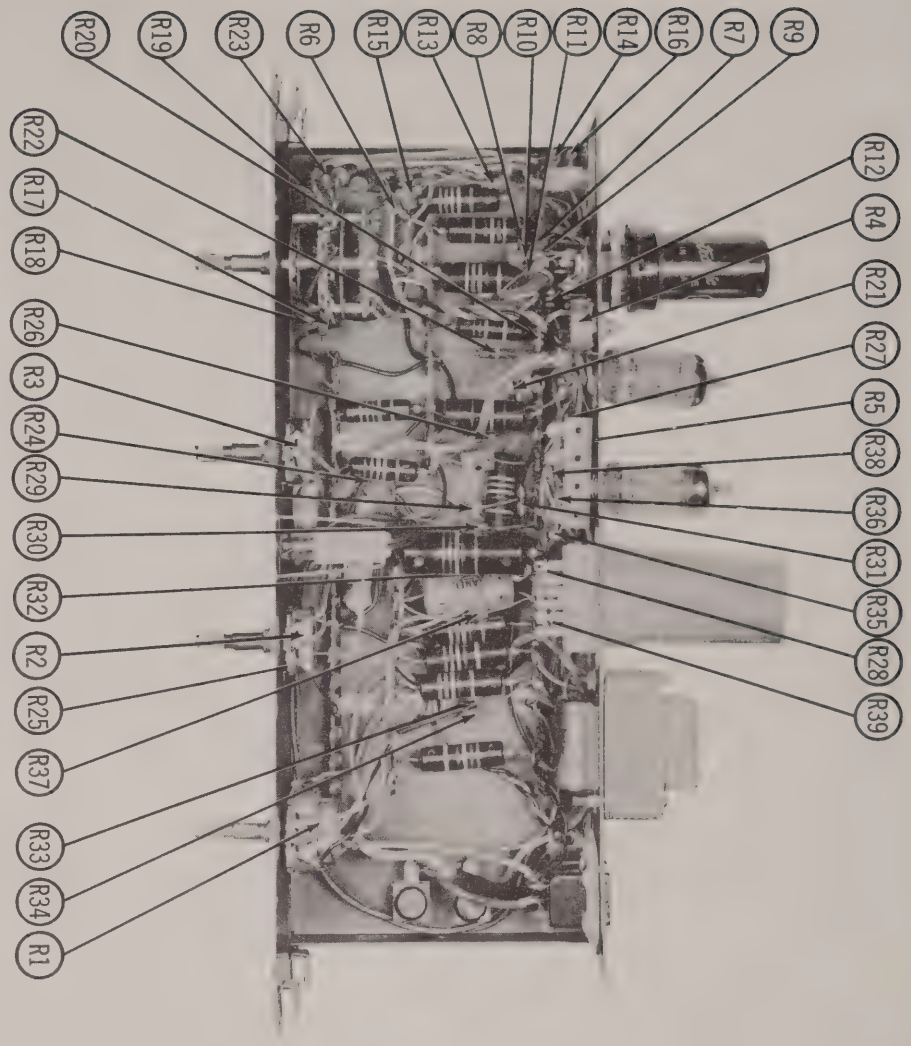
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	General Electric PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.006	RER-011 ①	8Y1		8S20	35	① Connect in series because of input voltage
M2	.006	RER-011 ①	8Y1		8S20	35	

MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M3	Dial light		# 44
M4	Switch	RSS-007	DPDT slide-volume-loudness
M5	Switch	RSW-100	Record comp. & programme select
	Knob	RDK-352	(4 used)
	Escutcheon	RDE-143	Front panel

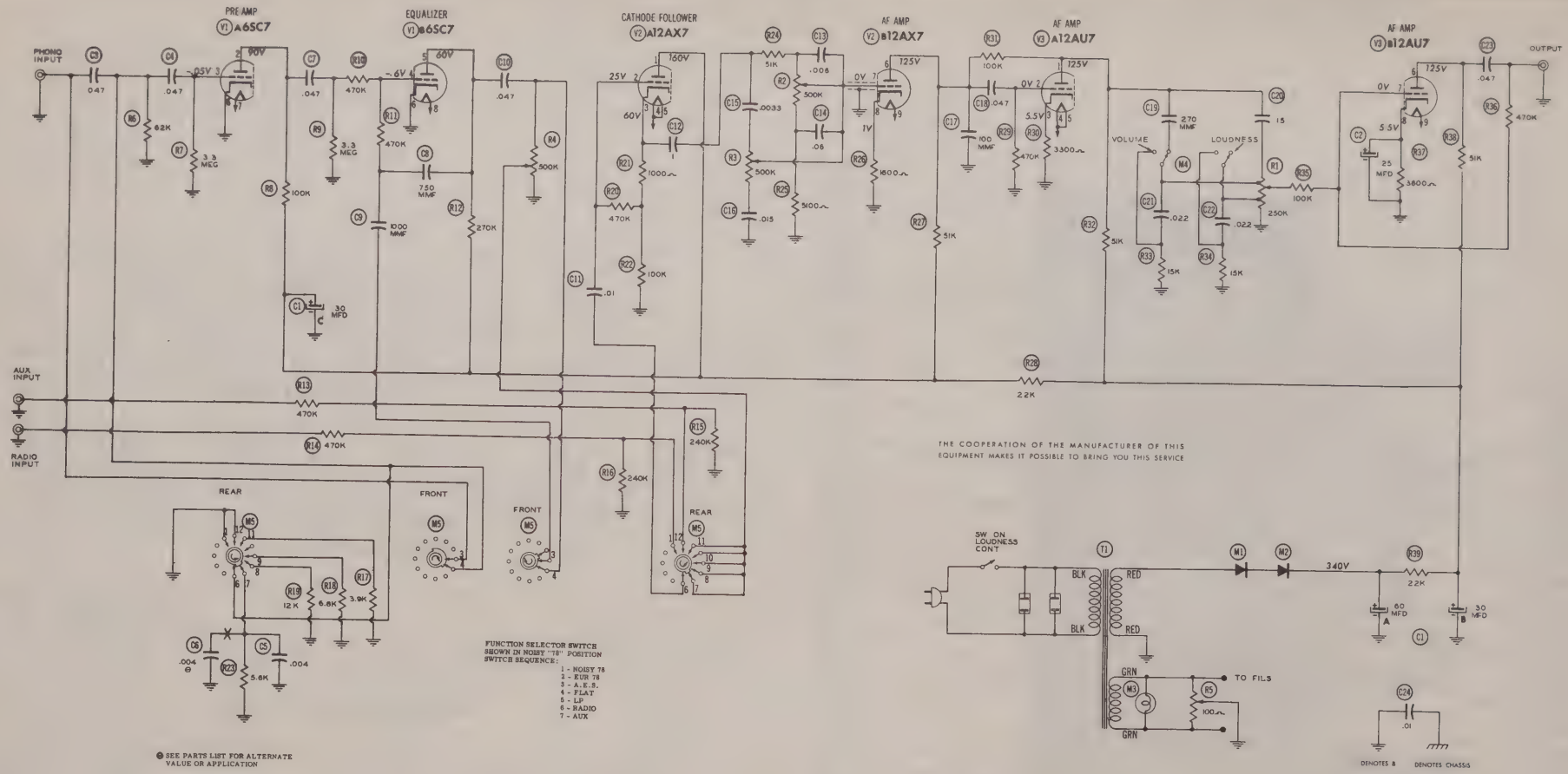
CHASSIS—BOTTOM VIEW



SET 243 FOLDER 6

GENERAL ELECTRIC MODEL A1-200

GENERAL ELECTRIC MODEL A1-200



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6SC7	0Ω	†145KΩ	3.3Meg	3.8Meg	†315KΩ	0Ω	25Ω	25Ω	
V 2	12AX7	†44KΩ	570KΩ	100KΩ	25Ω	25Ω	†95KΩ	500KΩ	1.6KΩ	25Ω
V 3	12AU7	†65KΩ	470KΩ	3.3KΩ	25Ω	25Ω	†73KΩ	130KΩ	3.6KΩ	25Ω

† MEASURED FROM OUTPUT OF SELENIUM RECTIFIER

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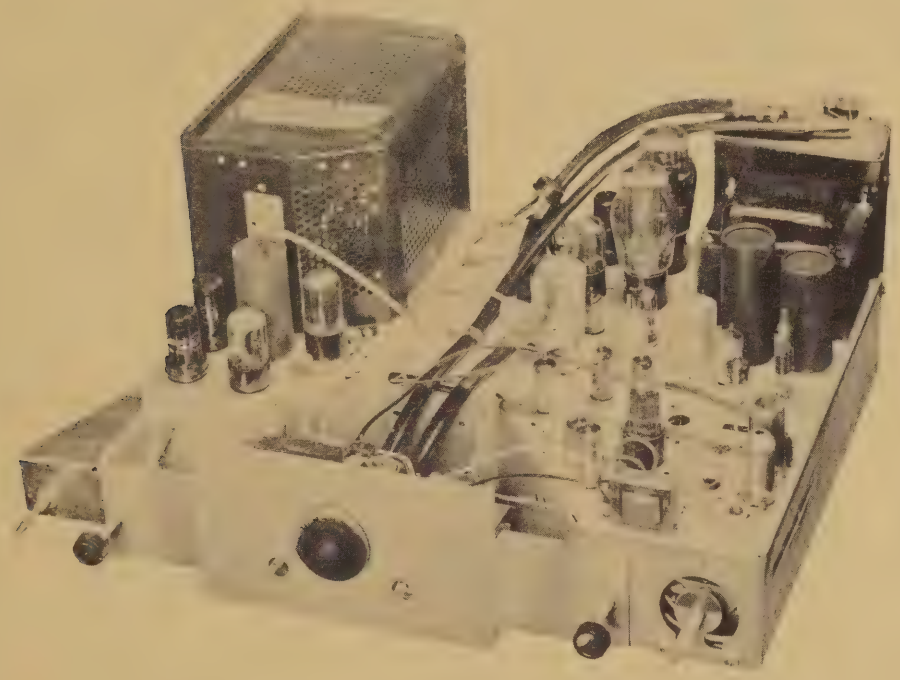

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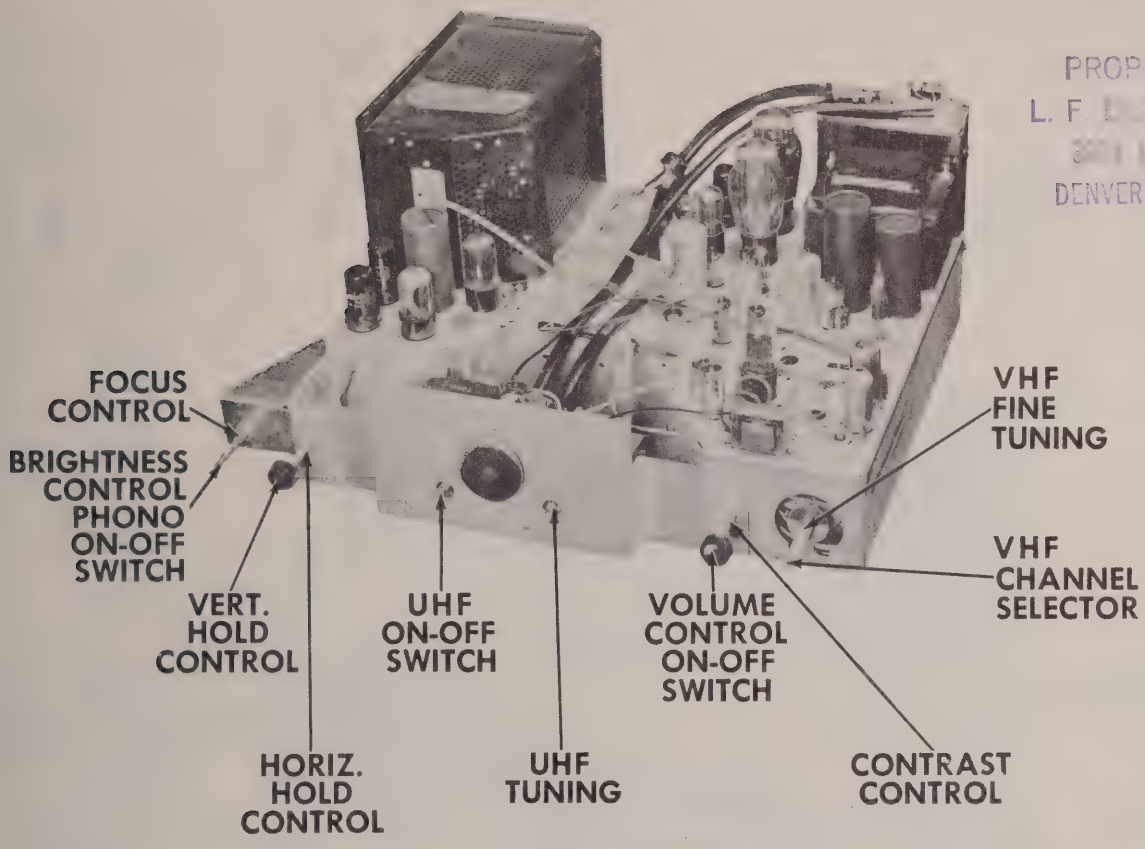

MATTISON
MODELS 630DXM, MDXL

MATTISON MODEL 630MDXL

TRADE NAME	Mattison Model 630DXM, 630MDXL (26000 Series)
MANUFACTURER	Mattison Television & Radio Corp., 10 W. 18lst. St., New York 53, N.Y.
TYPE SET	Television Receiver
TUBES	Thirty-two
POWER SUPPLY	110-120 Volts AC- 60 Cycles RATING 2.74 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83UHF, Video IF 26.25MC, Sound IF 21.25MC (Intercarrier)

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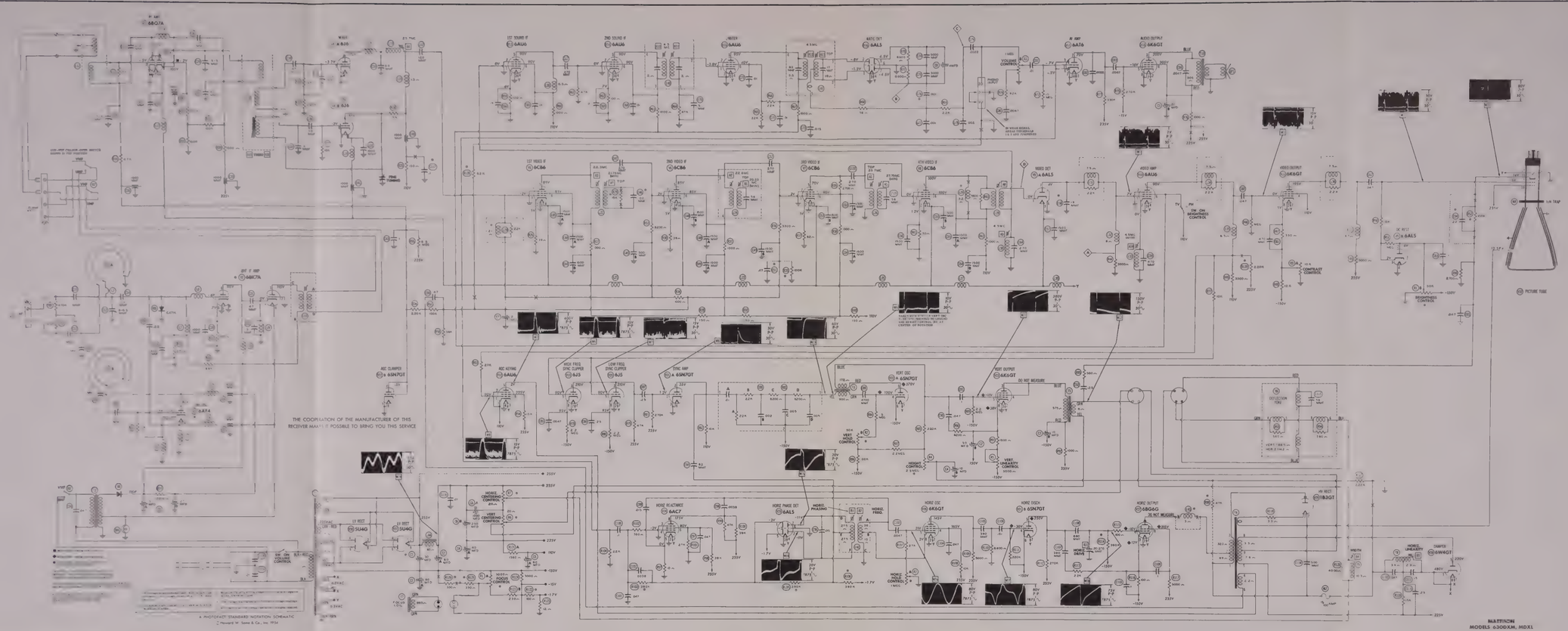
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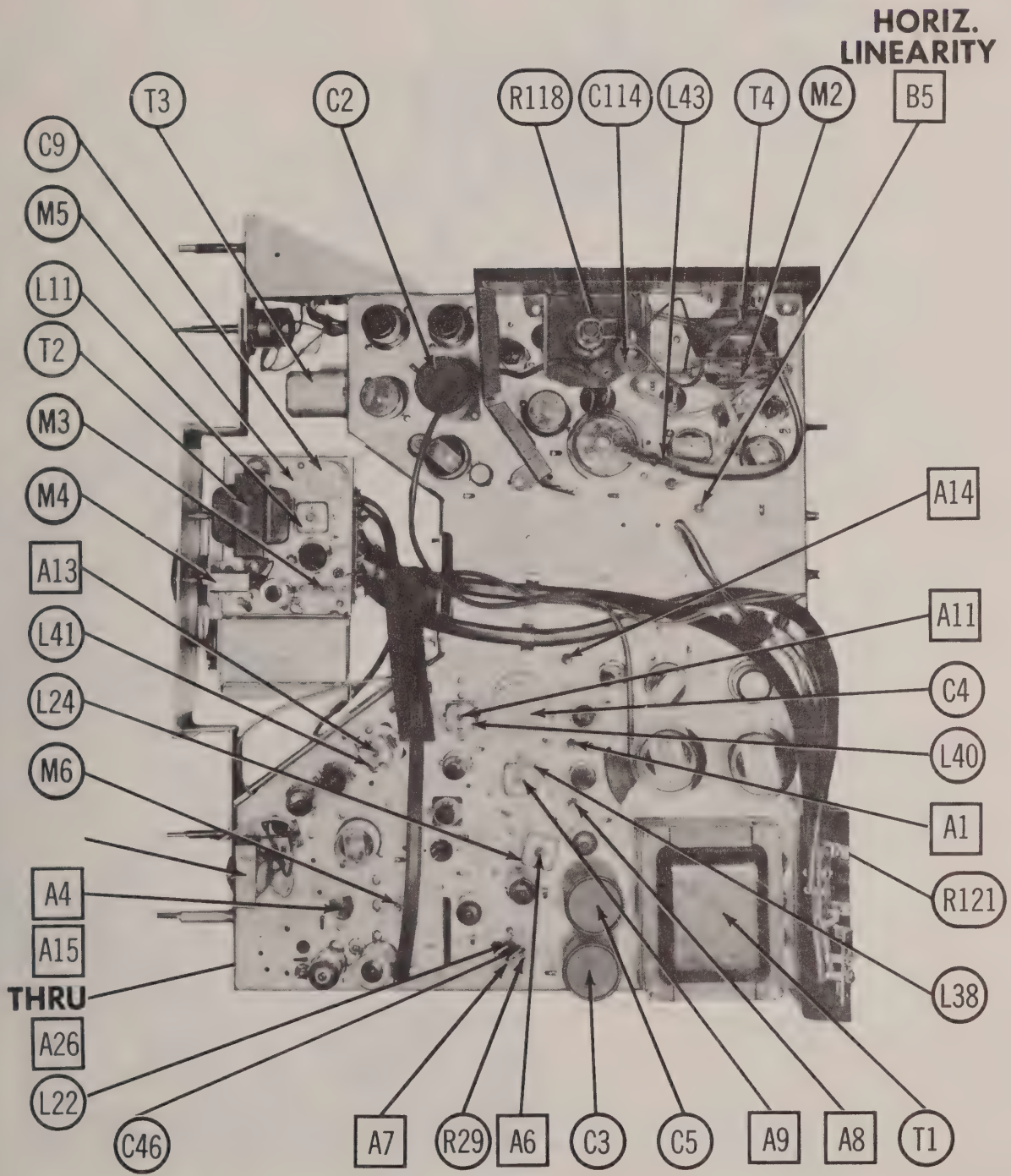
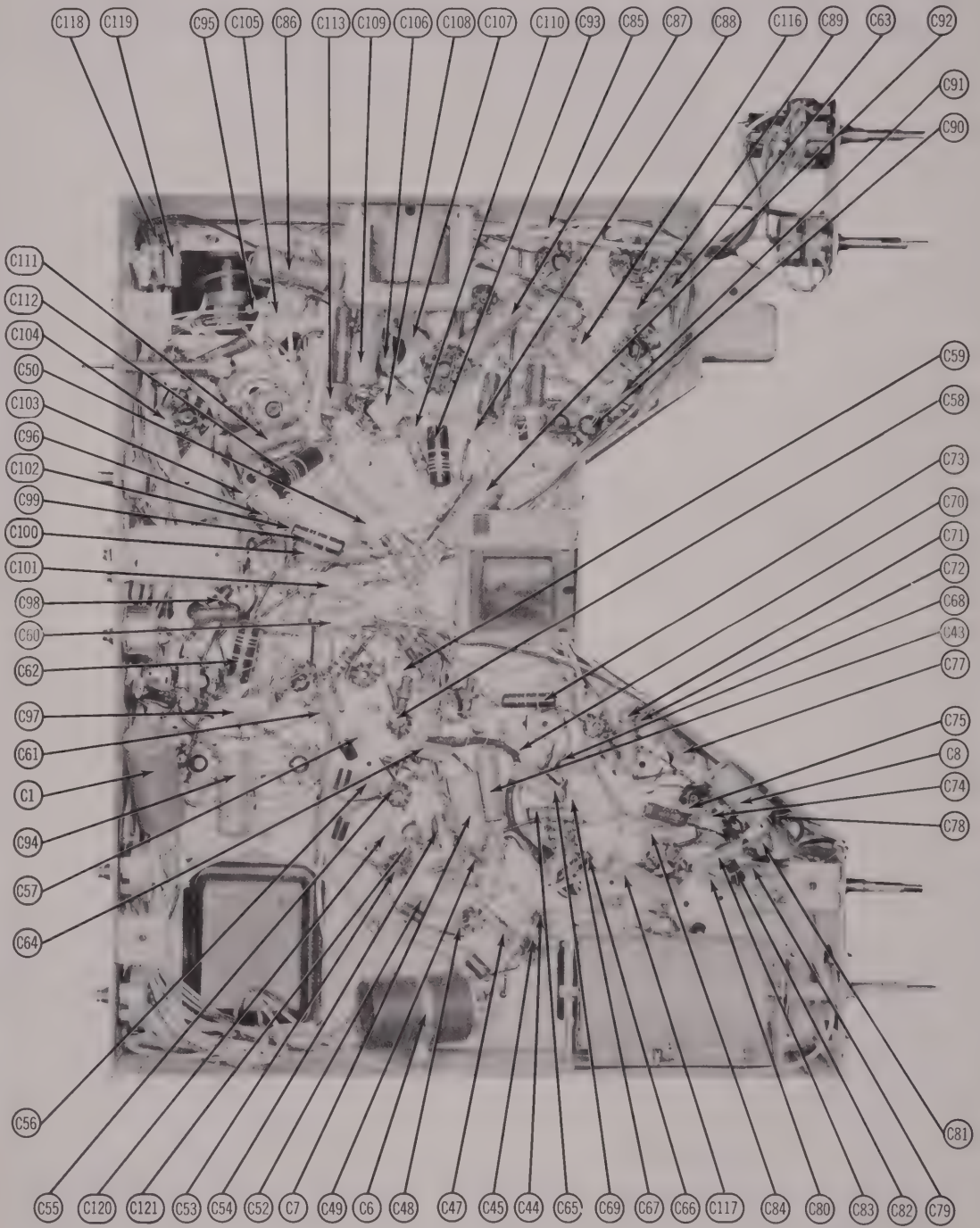


CHASSIS-TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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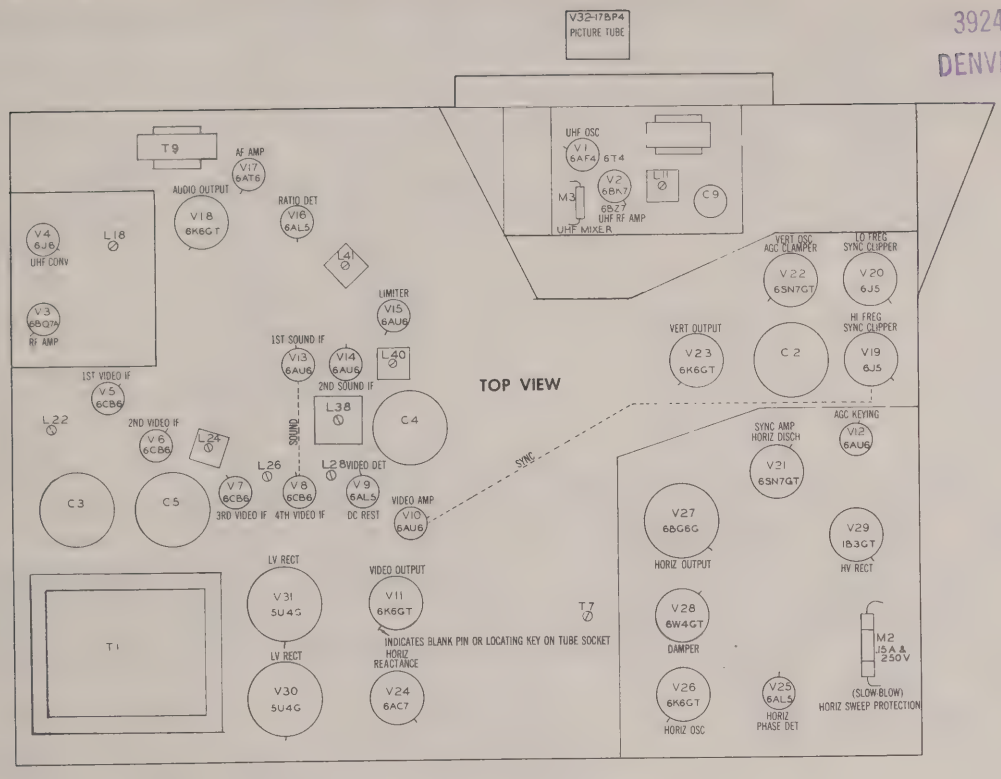
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V30, V31

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, V7, V8 (V1, V2 UHF only)
No pic, no sound, has snow - V3, V4, V5
No pic, has sound, has raster - V9, V10, V11, V32
Has pic, no sound - V13, V14, V15, V16, V17, V18
Overloaded picture - V12, V22

SYNC FAILURE
No vert. sync - V20, V21, V22
No horiz. sync - V19, V21, V24, V25, V26
No vert. or horiz. sync - V21

SWEEP FAILURE
No raster, has sound - V26, V27, V28, V29, V32, Fuse (M2)
No vertical deflection - V22, V23
Poor vert. linearity or foldover - V22, V23
Poor horiz. linearity or foldover - V26, V27, V28
Narrow picture - V26, V27, V28, V29, V30, V31
Vert. off freq. - V20, V21, V22
Horiz. off freq. - V19, V21, V24, V25, V26

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V4) from its socket and replace with a 6J6 which has Pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C49B. Connect the positive lead to chassis.
Attenuate generator output to maintain not more that 1.5 volts at VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.7MC (Unmod)	Any	DC probe to point ◇A. Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	22.8MC	"	"	A2	"
3.	"	"	22.3MC	"	"	A3	"
4.	"	"	25.7MC	"	"	A4	"
5.	"	"	27.75MC	"	"	A5	Adjust for MINIMUM deflection.
6.	"	"	20.25MC	"	"	A6	"
7.	"	"	21.75MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflections

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24.0MC (10MC Swp)	20.25MC 21.75MC 26.25MC 27.75MC	Any	Vert. Amp. to point ◇A. Low side to chassis.	A8	Check for response curve similar to Fig.1. Adjust A8 to reduce tilt. If necessary, retouch A1 thru A4 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to point ◇D. Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point ◇B. Common to chassis.	A9, A10, A11, A12	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point ◇C. Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to point ◇D. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point ◇B. Low side to chassis.	A9, A10, A11, A12	Disconnect stabilizing capacitor C8. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
10.	"	"	"	"	"	Vert. Amp. to point ◇C. Low side to chassis.	A13	Reconnect stabilizing capacitor. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to point ◇A. Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig.4). Common to chassis.	A14	Adjust for MINIMUM deflection.

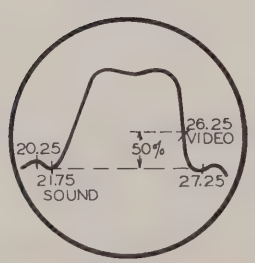


FIG.1

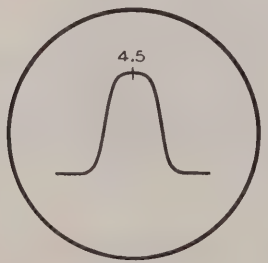


FIG. 2

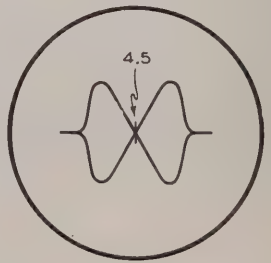


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning for best picture and sound. If any evidence of 4.5MC beat interference appears in the picture, adjust A14 to minimize it.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket. The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point A. Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A16	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A18	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A19	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A20	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A21	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A22	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A23	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A24	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A25	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A26	

RF AND MIXER ALIGNMENT

The tuner RF section and the UHF tuner section of this receiver has been properly aligned at the factory and is very stable. Alignment of these sections should not be required in the field.

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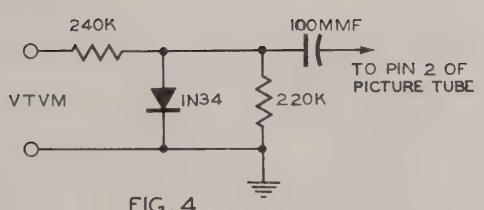


FIG. 4

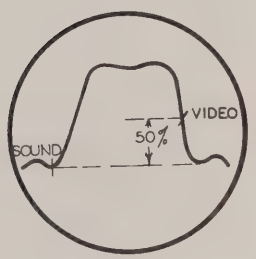
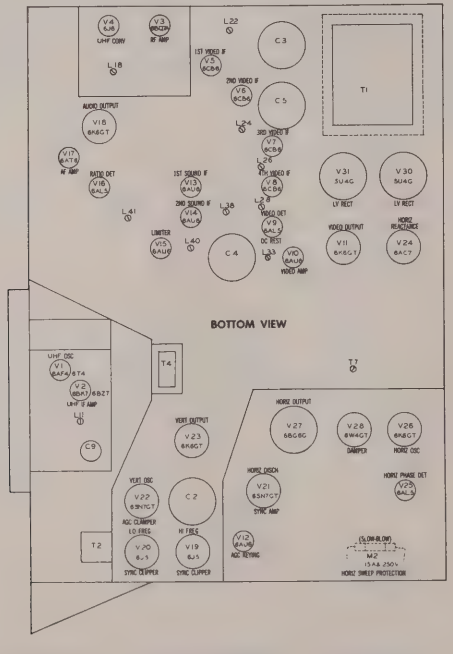


FIG. 5

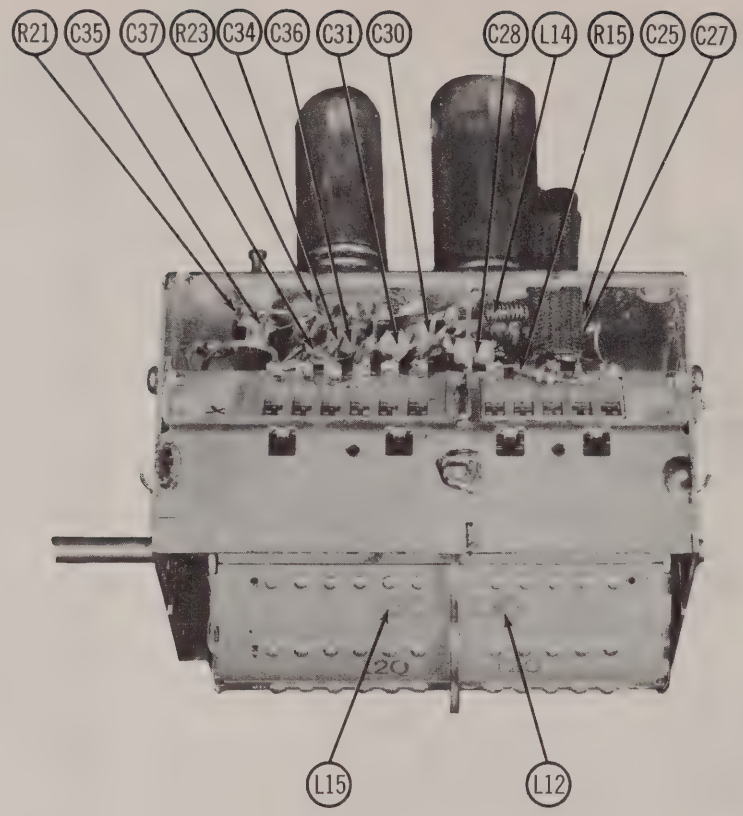
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	▲2.2KΩ	10KΩ	.1Ω	.2Ω	.1Ω	10KΩ	▲2.2KΩ		
V 2	6BK7A	▲0Ω	0Ω	0Ω	.1Ω	0Ω	▲.8Ω	270Ω	100Ω	0Ω
V 3	6BQ7A	INF	425KΩ	0Ω	0Ω	.1Ω	†1.6KΩ	170KΩ	INF	0Ω
V 4	6J6	†16.5KΩ	†1.5KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 5	6CB6	57KΩ	39Ω	0Ω	.1Ω	†2.9KΩ	†2.9KΩ	0Ω		
V 6	6CB6	65KΩ	39Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 7	6CB6	59KΩ	82Ω	.1Ω	0Ω	†5.3KΩ	†2.6KΩ	0Ω		
V 8	6CB6	.4Ω	150Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 9	6AL5	.6Ω	30KΩ	.1Ω	0Ω	1Meg	0Ω	3.9KΩ		
V 10	6AU6	3.9KΩ	0Ω	0Ω	.1Ω	†4.8KΩ	†1.5KΩ	.4Ω		
V 11	6K6GT	INF	0Ω	†4.8KΩ	†1.5KΩ	1Meg	12KΩ	.1Ω	1.2KΩ	
V 12	6AU6	†32KΩ	†1.5KΩ	.1Ω	0Ω	156KΩ	†15KΩ	†1.5KΩ		
V 13	6AU6	.2Ω	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	100Ω		
V 14	6AU6	47KΩ	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	100Ω		
V 15	6AU6	47KΩ	0Ω	0Ω	.1Ω	†2.5KΩ	†25KΩ	0Ω		
V 16	6AL5	INF	INF	0Ω	.1Ω	6.8KΩ	0Ω	6.8KΩ		
V 17	6AT6	10Meg	0Ω	.1Ω	0Ω	22KΩ	22KΩ	†330KΩ		
V 18	6K6GT	112Ω	.1Ω	†1.4KΩ	†1.1KΩ	270KΩ	100KΩ	0Ω	0Ω	
V 19	6J5GT	0Ω	.1Ω	†47KΩ	INF	†15KΩ	†100Ω	0Ω	2.2Meg	
V 20	6J5GT	0Ω	0Ω	†47KΩ	INF	†15KΩ	†100Ω	.1Ω	2.2Meg	
V 21	6SN7GT	†270KΩ	†11.5KΩ	0Ω	220KΩ	†270KΩ	325Ω	.1Ω	0Ω	
V 22	6SN7GT	375KΩ	375KΩ	0Ω	1.7Meg	▲420KΩ	325Ω	.1Ω	0Ω	
V 23	6K6GT	60KΩ	.1Ω	†1.6KΩ	†1.6KΩ	2.2Meg	1.8KΩ	0Ω	3.5KΩ	
V 24	6AC7	0Ω	0Ω	0Ω	1.4Meg	10Ω	†18KΩ	.1Ω	†22KΩ	
V 25	6AL5	780KΩ	390KΩ	0Ω	.1Ω	12Ω	0Ω	390KΩ		
V 26	6K6GT	INF	0Ω	†5KΩ	†10KΩ	32KΩ	†1.5KΩ	.1Ω	10Ω	
V 27	6BG6G	INF	.1Ω	100Ω	INF	390KΩ	390KΩ	0Ω	†5KΩ	TOP CAP ▲75Ω
V 28	6W4GT	†65Ω	INF	40KΩ	†70Ω	†75Ω	†75Ω	▲0Ω	▲0Ω	
V 29	1B3GT		PIN	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲395Ω
V 30	5U4G	INF	25KΩ	INF	342Ω	INF	342Ω	INF	25KΩ	
V31	5U4G	INF	25KΩ	INF	342Ω	INF	342Ω	340Ω	25KΩ	
V32	17BP4	0Ω	1Meg	PIN 10 65Ω	PIN 11 100KΩ	PIN 12 .1Ω				

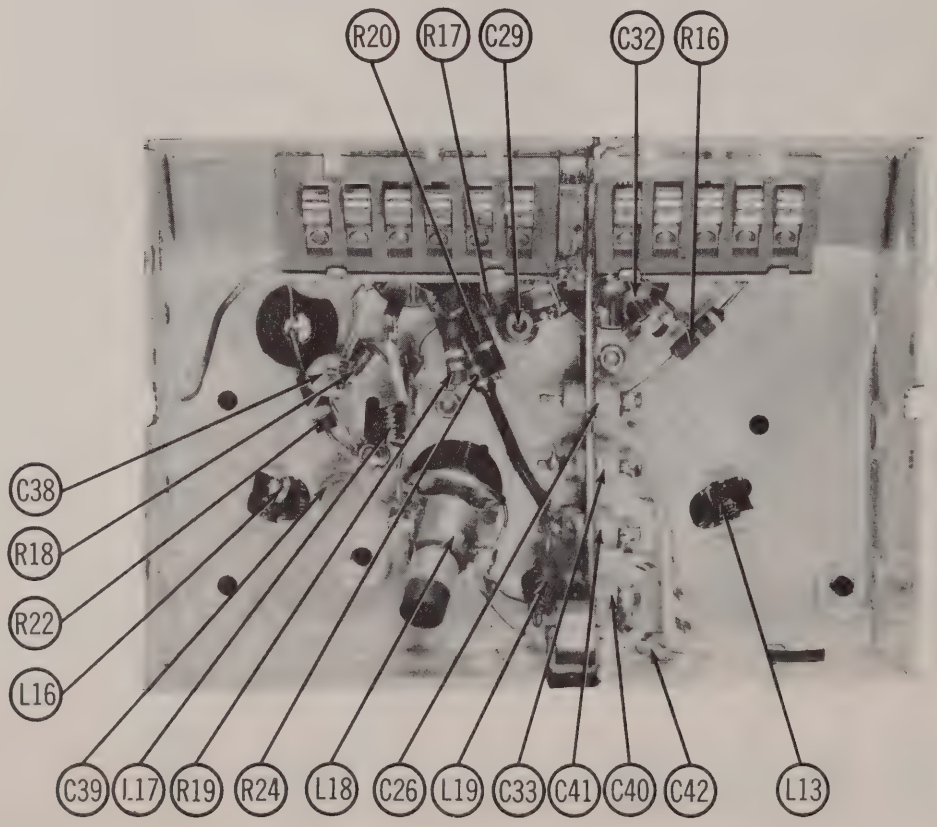
▲ MEASURED FROM OUTPUT OF M1
† MEASURED FROM PIN 8 OF V31
▲ MEASURED FROM PIN 3 OF V28



TUBE PLACEMENT CHART

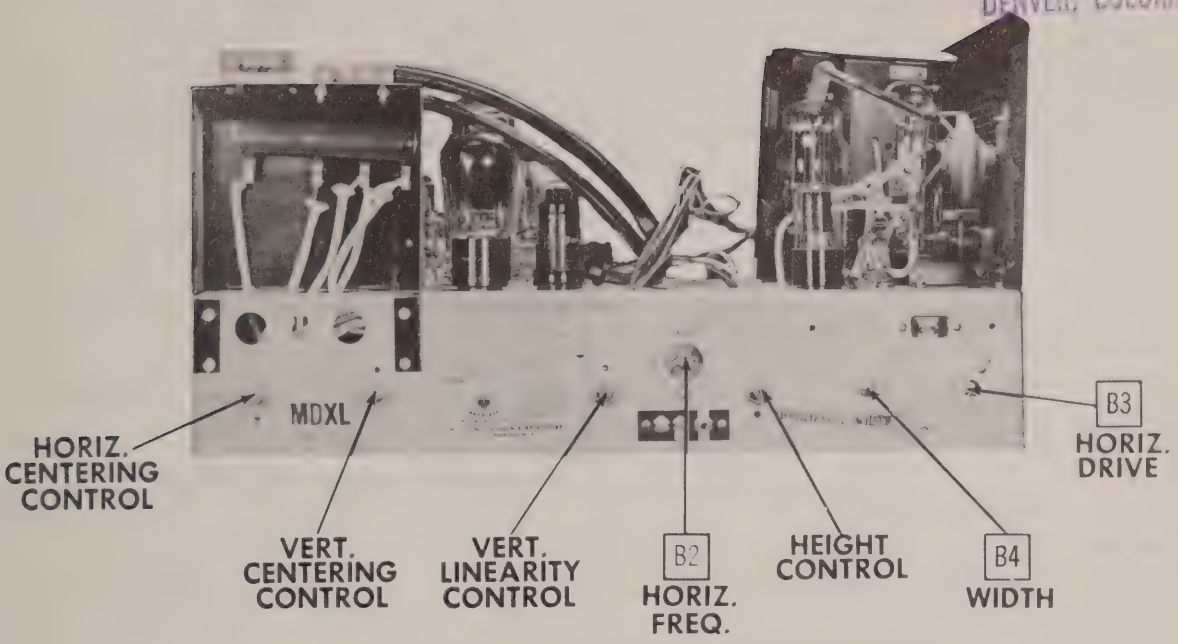


VHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLA[illegible]
3924 [illegible]
DENVER, COLORADO



CHASSIS—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the contrast control to slightly less than normal contrast.

If blanking bar appears at right of the picture adjust the horizontal phasing slug (B1) until blanking bar moves off the raster to the right.

Turn the horizontal hold control fully counter clockwise and adjust the horizontal frequency slug (B2) until picture falls out of sync, then reverse the adjustment until picture just synchronizes. Readjust B1 so that left side of the picture is close to left side of raster, but does not fold over. Turn the horizontal hold control fully clockwise. The right side of the picture should be near the right side of the raster, but should not fold over. If it does, readjust B1. Momentarily, remove the signal by switching off channel and back again. If necessary, readjust B2 until picture synchronizes. Turn the horizontal hold control fully counter clockwise. Picture should return to sync after momentary removal of signal.

Adjust the horizontal drive trimmer (B3) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width slug (B4) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B5) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V21, V27, V28, V30 and V31. Check adjustments B3, B4 and B5. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check C109, C114, T4, T6A, R118 and other associated circuit components.	Check R109, R111, R112, R114, C105, C106, C108 and other associated circuit components.

DRIVE LINES

Check adjustment B3. Check by substitution V21, V27 and V28. Check C111, C112, C113, C115, T4, T6A, C107, C108 and other associated circuit components for failure or change of value.

COMPRESSED LEFT SIDE

Check adjustments B3, B4 and B5. Check by substitution V21, V27 and V28. Check components associated with the horizontal output and damper stages, especially T4 and T6A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check V27 and V28 for internal arcing. Check associated components especially T4, T6A, T9 and T8.

XMAS TREE EFFECT

Check by substitution V24, V25 and V26. Check L42, C103, C105 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V22 and V23. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T5, T6B, R91, R92, R5 and other associated circuit components.	Check T3, R85, C91 and other associated circuit components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V22 and V23. Check T5, T6B, C2B and other associated components.

COMPRESSED AT TOP

Check by substitution V22 and V23. Check T2, C90, C91 and other associated circuit components.

FOLDS

Check by substitution V22 and V23. Check associated components including T3, T5 and T6B for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V21, V19 and V20. Check components associated with V19, V20 and V21A especially R79, R81 and C87.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Check by substitution V20, V21 and V22. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T3, R84 and other components associated with V22A.	Check vertical integrator and other associated sync components. Check the video IF and amplifier stages for overloading.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V19, V24, V25 and V26. Check associated circuit components especially L42, C96, C103, R105, R106 and R107.

HORIZONTAL BENDING

Check by substitution V24, V25, V26, V21 and V27. Check components associated with V24 for failure or change of value.

VIDEO

LOSS OF VIDEO

Check by substitution V9, V10 and V11. Check peaking coils, plate load resistors and coupling capacitors associated with these stages.

SOUND BARS (4.5MC Beat)

Adjust tuner fine tuning for best picture and sound. Check video IF alignment.

POOR CONTRAST

Check by substitution V9, V10 and V11. Check contrast control, picture tube and other associated circuit components.

NEGATIVE PICTURE

Check by substitution V9, V10, V11, V12, V22, V3, V5, V6 and V7. Check AGC network components for failure or change of value.

SMEAR

Check by substitution V9, V10 and V11. Check L31, L34, L36, R44, R45, R46, R49, C60, C62, contrast control, picture tube and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check V3, V5, V6, V7, V8, V9, V10 and V11 for heater to cathode leakage. In case of UHF check V1 and V2.

AUDIO

WEAK OR NO SOUND

Check by substitution V13, V14, V15, V16, V17 and V18. Check stages V17 and V18 using audio signal generator. Apply audio signal across R72.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V17 and V18 especially C83 and T10.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A13 for minimum buzz. If still unsatisfactory, substitute V16 and realign ratio detector and audio IF stages. Check C8, C74 and C75.

DISTORTED

Follow procedure outlined under Weak or No Sound.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MATTISON PART No.	STANDARD REPLACEMENT		
V1A	UHF Oscillator	6AF4	6AF4	7BK	
B	UHF Oscillator	6T4	6T4	7BK	
V2A	UHF IF Amp.	6BK7A	6BK7A	9AJ	
B	UHF IF Amp.	6BZ7	6BZ7	9AJ	
V3	VHF RF Amp.	6BQ7A	6BQ7A	9AJ	
V4	VHF Converter	6J6	6J6	8BF	
V5	1st Video IF Amp.	6CB6	6CB6	7CM	
V6	2nd Video IF Amp.	6CB6	6CB6	7CM	
V7	3rd Video IF Amp.	6CB6	6CB6	7CM	
V8	4th Video IF Amp.	6CB6	6CB6	7CM	
V9	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V10	Video Amplifier	6AU6	6AU6	7BK	
V11	Video Output	6K6GT	6K6GT	7S	
V12	AGC Keying	6AU6	6AU6	7BK	
V13	1st Sound IF Amp.	6AU6	6AU6	7BK	
V14	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V15	Limiter	6AU6	6AU6	7BK	
V16	Ratio Detector	6AL5	6AL5	6BT	
V17	AF Amplifier	6AT6	6AT6	7BT	
V18	Audio Output	6K6GT	6K6GT	7S	
V19	High Freq.-Sync Clipper	6J5	6J5	6Q	
V20	Low Freq. Sync Clipper	6J5	6J5	6Q	
V21	Sync Amplifier-Horiz. Discharge	6SN7GT	6SN7GT	8BD	
V22	Vert Oscillator-AGC Clamper	6SN7GT	6SN7GT	8BD	
V23	Vert. Output	6K6GT	6K6GT	7S	
V24	Horiz. Reactance	6AC7	6AC7	8N	
V25	Horiz. Phase Det.	6AL5	6AL5	6BT	
V26	Horiz. Oscillator	6K6GT	6K6GT	7S	
V27	Horiz. Output	6BG6G	6BG6G	5BT	
V28	Damper	6W4GT	6W4GT	4CG	
V29	HV Rectifier	1B3GT	1B3GT	3C	
V30	LV Rectifier	5U4G	5U4G	5T	
V31	LV Rectifier	5U4G	5U4G	5T	
V32	Picture tube				Replace with same type as original

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MATTISON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	30	500		PRS500/16 PRS500/16		BR3050		TC84		Note 1
C2A	▲80	450	ECE-104	AFH2-91		B072		FP244	TVL-2710	
B	▲50	50								
C3A	▲80	150	ECE-102	AFH3-146		C105		FP370	TVL-3761	
B	■10	450								
C	▲40	450								Note 1
C4A	▲40	450	ECE-101	AFH3-154		C032		FP396.2	TVL-3772	
B	■10	450								
C	▲10	350								Note 2
C5A	▲80	350	ECE-100	AFH2-95		B068		FP235	TVL-2730	
B	▲20	450								
C6A	▲1000	6	ECE-109	AFH2-74		B055		WP204	TVL-2140	
B	▲250	10								
C7	2	25		PRS150/4		BBR2-50T		TC302	TVA-1201	
C8	4	50		PRS150/4		BR550		TC30	TVA-1303	
C9A	■30	150		AFH2-10		B010		FP211	TVL-2422	
B	▲20	150								
C10	1			SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C11	1			SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C12	.8-6.5									
C13	1			SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C14	2.4									
C15	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C16	.22									
C17	3-10									
C18	10									
C19	1000									
C20	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C21	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C22	5			SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C23	1000									
C24	.047	400		489ZX-05	DF-503	CUB4S47		PT4147	4TM-S47	
C25	3-8				829-10					
C26	1000			EF-001	MFT-1000				503C-D1	
C27	2.2			SI2.2NP0	TCZ-2.2	Z006	NP0K-2R2		5TCCB-V22	
C28	1000			EF-001	MFT-1000				503C-D1	
C29	.5-3				829-3		3115-01-0R5	CT565A		
C30	1.5			SI1.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C31	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C32	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	1000			EF-001	MFT-1000				503C-D1	
C34	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C35	.5-3				829-3		3115-01-0R5	CT565A		
C36	10			SI10NP0	TCZ-10	Z018	NP0K-100	ZT-541	5TCC-Q1	
C37	5			SI5N750	TCN-5	N011	N750K-050	NT-555	5TCUB-V5	
C38	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	6.8			SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C40	1000			EF-001	MFT-1000				503C-D1	
C41	1000			EF-001	MFT-1000				503C-D1	
C42	120			BPD-00012	D6-121	G044	GP2K-121	UC-5312	5GA-T12	
C43	.1	400	ECP-113	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C44A	1500		ECC-111	BPD-2X0015	DD2-152	DK071	812-0015	DCD-5215	5HK-2D15	
B	1500									
C45A	1500		ECC-111	BPD-2X0015	DD2-152	DK071	812-0015	DCD-5215	5HK-2D15	
B	1500									

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADOW ST.
DENVER, COLO.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA MATTISON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C48	100		SD100T50	TCN-100	TN3	N750L-101	NT-531	NT-531	5TCU-T1	Note 3
C47	270	500	ECM-101	1468-0002	D6-271	5WS727	GP3K-271	MC341	1FM-33	
C48A	1500		ECC-111	BPD-2X0015	DD3-152	DK071	813-0015	DCD-5215	5HK-2D15	
B	1500									
C48A	1500		ECC-111	BPD-2X0015	DD3-152	DK071	813-0015	DCD-5215	5HK-2D15	
B	1500									
C50	.47	200	ECP-121	P288-47		CUB22P47		PT4047	2TM-P47	
C51	.47	200	ECP-121	P288-47		CUB22P47		PT4047	2TM-P47	Note 4
C53	270	500	ECM-101	1468-0003	D6-271	5WS727	GP3K-271	MC341	1FM-33	
C53A	1500		ECC-111	BPD-2X0015	DD2-152	DK071	813-0015	DCD-5215	5HK-2D15	
B	1500									
C54A	1500		ECC-111	BPD-2X0015	DD2-152	DK071	813-0015	DCD-5215	5HK-2D15	
B	1500									
C55A	1500		ECC-111	BPD-2X0015	DD3-152	DK071	813-0015	DCD-5215	5HK-2D15	
B	1500									
C56	1500		ECC-108	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C57	1500		ECC-108	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C58	18			TZ-18		TZ12	NP0K-180		5TCC-Q18	Note 5
C59	470	500	ECM-114	1469-0006		5RS747		MC8275	MS-35	
C60	.047	400	ECP-110	P488-047	DF-503	CUB4847		PT4147	47M-S47	
C61	470	500	ECM-114	1469-0006		5RS747		MC8271	MS-35	
C62	.047	500	ECP-110	P688-047	DF-503	CUB6847		PT6147	6TM-S47	
C63	1	600	ECP-113	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C64	270	500	ECM-101	1468-0003	D6-271	5WS727	GP3K-271	MC341	1FM-33	
C65	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C66	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C67	270	500	ECM-101	1468-0003	D6-271	5WS727	GP3K-271	MC341	1FM-33	
C68	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C69	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C70	51				TC-51	TN15	N750K-510		5TCC-Q51	
C71	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C72	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C73	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C74	.01	400	ECP-123	P488-01		CUB4S15		PT4U15	4TM-S15	
C75	5000		ECC-110	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C75	5000		ECC-110	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C76	.001	400	ECP-102	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	Note 4
C77	001	400	ECP-102	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C78	.0022	400	ECP-102	P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C79	.0022	400	ECP-102	P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C80	.0047	400	ECP-106	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C81	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C82	.0022	400	ECP-126	P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C83	.0047	400	ECP-105	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C84	.0047	400	ECP-105	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C85	.0047	400	ECP-105	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C86	.25	400	ECP-115	P488-25		CUB4P25		PT4025	4TM-P25	
C87	.25	400	ECP-115	P488-25		CUB4P25		PT4025	4TM-P25	
C88A	.01				DD-103	CUB6D1	GP2-333-103	PT611		
B	.002		●ENW-100	●PA-111	●PC-101	CUB6D2	GP2-333-222	PT622	●10SC1	
C	.005					CUB6D5	GP2-333-502	PT625		
D	.000					CUB6P33	GP2-333-503	PT625		
C89	4700	500	ECM-102	1464-005		5RS747		MC8465	MS-25	
C90	.047	600	ECP-111	P688-047	DF-503	CUB6847		PT6147	6TM-S47	
C91	.1	600	ECP-114	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C92	.25	400		P488-25		CUB4P25		PT4025	4TM-P25	
C93	.047	600	ECP-111	P688-047	DF-503	CUB6847		PT6147	6TM-S47	
C94	.22	400		P488-25		CUB4P22		PT4022	4TM-P22	Note 4
C95	82		ECM-100-A		TCN-82	TN20	N750L-820			
C96	.015	400	ECP-123							
C97	.047	400	ECP-110	P488-047	DF-503	CUB4847		PT4147	4TM-S47	
C98	.0039	400	ECP-103	1464-004		1RSD39		MC8463	MS-24	
C99	.015	400	ECP-123							
C100	.1	600	ECP-113	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C101	.047	400	ECP-110	P488-047	DF-503	CUB4847		PT4147	4TM-S47	
C102	.0039	400	ECP-103	1464-004		1RSD39		MC8463	MS-24	
C103	.0047	400	ECP-106	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C104	.047	400	ECP-110	P488-047	DF-503	CUB4847		PT4147	4TM-S47	
C105	390	500	ECM-113	1469-0004		5RS739		MC8243	MS-34	
C106	.01	400	ECC-106	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C107	390	500	ECM-113	1469-0004		5TST39		MC8243	MS-34	
C108	680	500	ECM-115	1479-0007		5RST68			MS-37	
C109	.1	600	ECP-114	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C110	.1	400	ECP-113	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C111	.15	600	ECP-117	684-15		PM6P15		TP417	6TM-P15	
C112	.047	600	ECP-111	P688-047		CUB6S47		PT6147	6TM-S47	
C113	.25	600	ECP-124	684-25		CUB6P25		PT6025	6TM-P25	
C114	500	20000	ECC-105-B	HY30C	TV3-502	MMU20T5	413	HY20035A	20DK-T5	
C115	500	1000	ECC-106				2KV-560		20GA-Q56	
C116	.01	400	ECP-107	P488-01	D6-103	CUB4S1	GP3-333-103	PT4U	4TM-S1	
C117	.1	400	ECP-113	P488-1	DF-104	CUB4P1		PT401	4TM-P1	Note 4
C118	.01	400	ECP-107	489ZX-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C119	.01	400	ECP-107	489ZX-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C120	270	500	ECM-101	1468-0003	D6-271	5WS727	GP3K-271	MC341	1FM-33	
C121	56			SD56	D6-560	TP31	GP1K-560	UC-5456	5CA-Q56	

Note 1. Some models replace C1 with C8C
Note 2. C4C is not used.
Note 3. Some models use 47MMF in this application.
Note 4. Not used in all models.
Note 5. Some models use 10MMF in this application.
♦ Items C88A, C88B, C88C, C88D, R83A, R83B, R83C, R83D are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MATTISON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω	4	CM8629					Focus Panel Wire wound - Note 1
B	50KΩ	1						Brightness & phone SW Rear Note 2
R2A	1 Meg		20-2A	*QJ-161	RTV-110	5BB-505	UF16L } †	Horiz. Hold Panel-Note 3
B	50KΩ						UR54L }	Vert. Hold-Rear
R3	10KΩ		EP-107	■QJ-60	RTV-1	5BBT-504-8	UR14R	Contrast Panel
B	1 Meg						UR16-T25 ††	Volume tapped at 280KΩ Rear
C	Switch						UB26	Attach to R3B

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MATTISON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R4A	2.5Meg	½	EP-101A	QU-239	A47-2.5Meg-S	AB-53	3U-565	Height-Note 4
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	5000Ω	3	EP-111	WK-5000	A43-5000	VK-135	R5000L	Vert. Oscarity Wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6	20Ω	2	970111-16	W-20J10	RTV-96	5VT-901	R20CT	Vert. centering Wire wound Note 5
R7	20Ω	2	970111-16	W-20	RTV-96	5VT-901	R20CT	Horiz. centering Wire wound Note 5

● CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENT & SHAFTS B11-137 & P1-121 (Panel)
B11-123 & R2-205 (Rear)
■ CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENT & SHAFTS B17-116 & P1-121 (Panel)
B13-137X & R1-205 (Rear) & SWITCH 78-1
† Universal replacement (Mallory exact duplicate Part No. UF 168)
†† Universal replacement (Mallory exact duplicate Part No. UE 720S)
Note 1. Some models may use a single control Part No. EP 108 in this application.
Note 2. Some models may use a single control Part No. EP 106 in this application.
Note 3. Some models may use an alternate control Part No. EP 105.
Note 4. Some models may use an alternate control Part No. EP-101.
Note 5. Some models may use an alternate control Part No. EP-104.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MATTISON PART No	IRC PART No	NOTES
R8	470KΩ	½		BTS-470K	
R9	470KΩ	½		BTS-470K	
R10	270Ω	½		BTS-270	
R11	10KΩ	½		BTS-10K	
R12	100Ω	½		BTS-100	
R13	68KΩ	½		BTS-68K	
R14	2200Ω	1		BTA-2200	
R15	15KΩ	½		BTS-15K	
R16	47KΩ	½		BTS-47K	
R17	100KΩ 5%	½		BTS-100K 5%	
R18	160KΩ	½		BTS-160K	
R19	100KΩ	½		BTS-100K	
R20	150Ω	½		BTS-150	
R21	10KΩ	½		BTS-10K	
R22	220KΩ	½		BTS-220K	
R23	10KΩ	½		BTS-10K	
R24	15KΩ	½		BTS-15K	
R25	150Ω	½	ERA-1501	BTS-150	
R26	39Ω	½	ERA-3901	BTS-39	
R27	1000Ω	½	ERA-1021	BTS-1000	
R28	150Ω	½	ERA-1501	BTS-150	
R29	153Ω	½	ERA-1531	BTS-153	Note 1
R30	39Ω	½	ERA-3901	BTS-39	
R31	1000Ω	½	ERA-1021	BTS-1000	
R32	150Ω	½	ERA-1501	BTS-150	
R33	8200Ω	½	ERA-8221	BTS-8200	
R34	1000Ω	½	ERA-1021	BTS-1000	
R35	100KΩ	½	ERA-1041	BTS-100K	Note 1
R36	3300Ω 5%	½	ERA-3323	BTS-3300 5%	
R37	82Ω	½	ERA-8201	BTS-82	
R38	1000Ω	½	ERA-1021	BTS-1000	
R39	2700Ω	½	ERA-2725	BTS-2700	
R40	150Ω	½	ERA-1511	BTS-150	
R41	150Ω	½	ERA-1511	BTS-150	
R42	1000Ω	½	ERA-1021	BTS-1000	
R43	5600Ω 5%	½	ERA-5625	BTS-5600 5%	Note 4
R44	3900Ω 5%	½	ERA-3925	BTS-3900 5%	
R45	3300Ω	½	ERA-3321	BTS-3300	
R46	1 Meg	½	ERA-1051	BTS-1 Meg	
R47	33Ω	½	ERA-33J1	BTS-330	
R48	12KΩ	2	ERC-1231	BTB-12K	
R49	3000Ω	5	ERD-115		
R50	10KΩ	½	ERA-1031	BTS-10K	
R51	1 Meg	½	ERA-1051	BTS-1 Meg	
R52	100KΩ	½	ERA-1041	BTS-100K	Note 1
R53	27KΩ	½	ERA-2731	BTS-27K	
R54	15KΩ	½	ERA-1531	BTS-15K	
R55	6.8Meg	½		BTA-6.8Meg	
R56	220KΩ	½	ERA-2241	BTS-220K	
R57	100KΩ	½	ERA-1041	BTS-100K	
R58	56KΩ	½		BTS-56K	
R59	100Ω	½	ERA-1011	BTS-100	
R60	1000Ω	½	ERA-1021	BTS-1000	
R61	47KΩ	½	ERA-4731	BTS-47K	
R62	100Ω	½	ERA-1011	BTS-100	
R63	1000Ω	½	ERA-1021	BTS-1000	
R64	47KΩ	½	ERA-4731	BTS-47K	
R65	22KΩ	½		BTA-22K	
R66	22KΩ	½	ERA-2231	BTS-22K	
R67	1000Ω	½	ERA-1021	BTS-1000	
R68	56Ω	½		BTS-56	
R69	22KΩ	½	ERA-2231	BTS-22K	
R70	6800Ω	½	ERA-6821	BTS-6800	
R71	6800Ω	½	ERA-6821	BTS-6800	
R72	10 Meg	½	ERA-1061	BTS-10 Meg	
R73	330KΩ	½	ERA-3341	BTS-330K	
R74	82KΩ	½	ERA-8231	BTS-82K	
R75	270KΩ	½	ERA-2741	BTS-270K	
R76	100Ω	5		1 3/4A-1000	
R77	10KΩ	½	ERA-1031	BTS-10K	
R78	2.2 Meg	½	ERA-2251	BTS-2.2Meg	
R79	47KΩ	½	ERA-4731	BTS-47K	
R80	2.2 Meg	½	ERA-2251	BTS-2.2 Meg	
R81	270KΩ	½	ERA-2741	BTS-270K	
R82	10KΩ	1	ERD-1031	BTA-10K	
R83A	22KΩ	½		BTS-22K	
B	22KΩ	½	♦ ENW-100	BTS-22K	
C	8200Ω	½		BTS-8200	
D	8200Ω	½		BTS-8200	
R84	1.5 Meg 5%	½	ERA-1555	BTS-1.5 Meg	
R85	220KΩ	½	ERA-2241	BTS-220K	
R86	100KΩ	½	ERA-1041	BTS-100K	
R87	2.2Meg	½	ERA-2251	BTS-2.2Meg	
R88	47KΩ	½	ERA-4731	BTS-47K	Note 1
R89	2.2Meg	½	ERA-2251	BTS-2.2Meg	
R90	8200Ω	½	ERA-8221	BTS-8200	
R91	1800Ω	½	ERA-1821		
R92	1000Ω	½	ERB-1021	BTA-1000	
R93	560Ω	½	ERA-5611	BTS-560	
R94	560Ω	½	ERA-5611	BTS-560	
R95	560Ω	½	ERA-5611	BTS-560	
R96	2700Ω	½	ERA-2221	BTS-2700	
R97	10Ω	½	ERA-1001	BTS-10	
R98	39KΩ	1		BTA-39K	
R99	47KΩ	1	ERA-4731	BTA-47K	
R100	39KΩ	1		BTA-39K	
R101	27KΩ	1	ERA-2731	BTA-27K	
R102	560Ω	½	ERA-5611	BTA-560	
R103	390KΩ	½	ERA-4741	BTS-390K	Note 4
R104	22KΩ	½	ERA-2231	BTS-22K	
R105	390KΩ	½	ERA-4741	BTS-390K	Note 4
R106	390KΩ	½	ERA-4741	BTS-390K	Note 4
R107	27KΩ	½	ERA-2731	BTS-27K	
R108	10KΩ	1	ERB-1031	BTA-10K	
R109	5000Ω	10	ERD-112	1 3/4A-5000	
R110	6800Ω	½	ERA-6821	BTS-6800	
R111	220KΩ	½	ERA-2241	BTS-220K	
R112	270KΩ	½	ERA-2741	BTS-270K	
R113	22KΩ	½	ERA-2231	BTS-22K	
R114	390KΩ	½		BTS-390K	Note 4
R115	100Ω	2	ERA 1011	BTS-100	
R116	100Ω	2	ERC-1011	BTB-100	
R117	5000Ω	10	ERD-112	1 3/4A-5000	
R118	3.3Ω	5	ERA-33G1		
R119	5KΩ	15	63-2475		
R120	4000Ω	10		1 3/4A-4000	
R31A	13600Ω	27	ERD-102		
B	2300Ω				
R122	100Ω	5		1 3/4A-100	Note 2
R123	120Ω	1	ERB-1201		
R124	30000Ω	5			
R125	330Ω	5			N-te 3
R126	330Ω	5			Note 3
R127	220KΩ	½	ERA-2241	BTS-220K	
R128	82KΩ	½		BTS-82K	Note 1
R129	220KΩ	½		BTS-220K	Note 1

♦ Items R83A, R83B, R83C, R83D, C88A, C88B, C88C, C88D are combined in one unit.
Note 1. Not used in all models.
Note 2. Some models may use a 95Ω resistor in this application.
Note 3. Some models may use a single 600Ω resistor in this application.
Note 4. Some models may use a 450KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No	RATING PRI	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA MATTISON PART No.	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T1	UTVAC ① 2.74A	720VCT ② 300ADC	5 VAC ③ 6A	ET-101B	P-8166 ①	P-3053 ① ② ③	R-37BC		P9737 ①	26R09 ④
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ③ 1.2A	6.3VAC ④ 10A								

① Parallel phase 6.3V windings for Sec. # 4.
② Parallel phase 5V windings for Sec. # 2.
③ Use high voltage taps for Sec. # 1.
④ Parallel and phase three 6.3V ③ 3A windings for Sec. 4.

TRANSFORMER (POWER)

ITEM No	RATING PRI	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA MATTISON PART No.	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T2	UTVAC ④ 9A	110VAC ⑤ 0035A tap & 6.3VAC & 5.4A		T390						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA MATTISON PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Halldorson PART No	Thordorson PART No
T3	Vert. Osc. Trans.	T-1036-1	A-8121	A-4000	A-97K	208T2	B6703	TV-24A88
T4	Horiz. Output Trans.	ET-105	A-8136 *	HVO-10 *	D-15 *	231T1 &*,	FB410 *②	
			2④	②	②④	214R1⑩		
T5	Vert. Output Trans.	ET-103	A-8143 ①	A-3038 ①	A-107X	204T2 ①	Z1802 ①	T-26853①
T6A	Yoke - Horiz. (6MH)	EL-151-B		MDP-70	Y-12-1		DF601	Y-5
B	Yoke - Vert. (41MH)	EL-122D ② EL-138 ②						
T7	Focus Coil		MF-4	B-10008				FC-4
T8	Horiz. Linearity (.6-3MH) (Tapped)	EL-126	WC-2			20HR5		WC-16 ①
T9	Width (.6-5MH)	EL-141	WC-8	MWC-6 ①	WC-12 ①	21HR1		WC-17
		EL-127 ①						

① Alternate vert. osc. trans.
② IF AGC fails to function properly, reverse AGC winding
③ Use original mounting bracket.
④ Drill new mounting holes.
⑤ Drill one new mounting hole.
⑥ Alternate yoke.
⑦ Enlarge mounting hole.
⑧ Alternate width coil.
⑨ Connect to coded blue and green terminals.
⑩ Remove or short original width coil and R120. Change R117 to 15KΩ. If AGC fails to function properly, reverse secondary (or primary) of 214R1.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordorson Replacement Connections
	3	3	3	1B3 Rect. Plate Lead	1B3 Rect. Plate Lead	1B3 Rect. Plate Lead	
	2	2	2	7	3	9	
	1	1	1	8	1	4	
	8	4	4	4	10	8	
	7	5	5	1	6	6	
	5	7	6	T	4	7	
	4	9	7	6	214R1 (Term. A)	1	
	6	8	9	2	214R1 (Term. B)	U	
Connect Width Coil Across →					214R1 (Term. C & D) 4 & 5		
Special Notes →		② ③	②	②④	⑩	②	

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA MATTISON PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordorson PART No	NOTES
T10	6.5KΩ	3 4Ω	ET-105	A-3878	A-2931	S-7X	Z1000	TS-24S51	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C IMP.	REPLACEMENT DATA MATTISON PART No	VIKING PART No	QUAM PART No	NOTES
SP1	12'	PM	3.4Ω		12J11	12A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MATTISON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L1A	UHF Ant. Coil	0Ω						
B	UHF Osc. Coil	0Ω						
L2	UHF Ant. Coil-End Inductor	0Ω						
L3	RF Choke	0Ω		U-407				
L4	Fil. Choke	.1Ω		U-420				
L5	Fil. Choke	0Ω		U-407				
L6	Cathode Choke	0Ω		U-407				
L7	RF Choke	0Ω		U-421				
L8	UHF IF Coupling	0Ω		U-406				
L9	Cathode Choke	0Ω		U-406				
L10	RF Choke	.4Ω		U-501				1 Microhenries; IRC Part # CLA
L11	UHF IF Output-Coil	0Ω	0Ω	U-409				
L12	VHF Ant. Coils	0OCT	0Ω					
L13	Fil. Choke	0Ω						

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MATTISON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L14	Neutr. Coil	0Ω						
L15	VHF RF, Mixer Grid & Osc. Coils	0Ω						
L16	Fil. Choke	0Ω						
L17	RF Choke	0Ω						
L18	1st Video IF	.7Ω						
L19	RF Choke	1.3Ω						
L20	RF Choke	2.1Ω			19-6033 *	TV-180 *	6176 *	30 Microhenries; wound on 22KΩ resistor; Note 1
L21	Fil. Choke	0Ω		EL-111	19-3001	TV-189	6175	.7 Microhenry
L22	2nd Video IF	.3Ω		EL-120			6246 †	Includes trap
L23	Fil. Choke	0Ω		EL-111	19-3001	TV-189	6175	.7 Microhenry
L24	3rd Video IF	.2Ω		EL-101	17-1002	TV-101	6187	Includes trap
L25	Fil. Choke	0Ω		EL-111	19-3001	TV-189	6175	.7 Microhenry
L26	4th Video IF	.4Ω		EL-121			6245	Includes trap
L27	Fil. Choke	0Ω		EL-111	19-3001	TV-189	6175	.7 Microhenry
L28	5th Video IF	.3Ω	.3Ω	EL-122	17-1064	TV-116	6250	
L29	RF Choke	3.2Ω			19-6022		4626	28 Microhenries; Not used in all models
L30	Fil. Choke	0Ω		EL-111	19-3001	TV-189	6175	.7 Microhenry
L31	Series Peaking Coil	7.5Ω		EL-107	19-4122	TV-182	6178	120 Microhenries; wound on 22KΩ resistor
L32	Shunt Peaking Coil	8Ω		EL-106	19-3250	TV-185	6181	250 Microhenries
L33	4.5MC Trap	.4Ω		EL-102	20-1004	TV-151	1470	
L34	Series Peaking Coil	7.5Ω		EL-107	19-4122	TV-182	6178	120 Microhenries; wound on 22KΩ resistor
L35	Shunt Peaking Coil	6.5Ω		EL-108	19-3093	TV-181	6177	93 Microhenries
L36	Series Peaking Coil	7.5Ω		EL-107	19-4122	TV-182	6178	120 Microhenries; wound on 22KΩ resistor
L37	Shunt Peaking Coil	6.5Ω		EL-108	19-3093	TV-181	6177	93 Microhenries
L38	1st Sound IF	.2Ω			17-1031 ■	TV-113 ♦	1470-A▲	
L39	RF Choke	6.5Ω		EL-108	19-3093	TV-181	6177	93 Microhenries
L40	2nd Sound IF	2Ω	2Ω	1645-2	16-3445 ▲	TV-113	6203	
L41	Ratio Det.	5.5Ω	1.9ΩCT	EL-153	17-3497	TV-115	6205	Tertiary winding=.7Ω
L42	Horiz. Discriminator	46Ω	55ΩCT	ET-100	20-1400	TV-160	6194	Prl. tapped @ 11Ω
L43	RF Choke	3Ω			19-6022		4626	28 Microhenries; not used in all models

Note 1. Some models may use L20 with no shunt resistor.
* Parallel with 22KΩ resistor.
† Add 15KΩ resistor across trap winding.
■ Disconnect C64, cut out 7/8" square chassis hole.
♦ Use one winding only, cut out 3/4" square chassis hole. Use adaptor plate and disconnect C64.
▲ Disconnect C64.
▲ Drill mounting holes.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA MATTISON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L44	.300A	65Ω	2.2HY	EL-203	C-2334 ①				20C44 ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	MATTISON PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	NOTES
M1	.0035A	H-373	8J1	1263A	8S20	35	

FUSES

ITEM No.	TYPE	RATING	MATTISON PART No. FUSE	MATTISON PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG S/B P/T	15/100A 250V	EF-101		315.150 (3AG S/B P/T 15/100A)		MDV 15/100	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	MATTISON PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M3			1N82 or A		UHF Mixer

MISCELLANEOUS

ITEM No.	PART NAME	MATTISON PART No.	NOTES
M4	Dial light		# 51 (UHF tuner)
M5	Tuner		UHF
M6	Tuner	EFE-105	VHF
M7	Switch		UHF on-off
M8	Ion trap		
B3	Trimmer cap	ECM-112	Horiz. drive (20-270MMF)

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, substitute V30 and V31. Check B+ filter and decoupling network components.

SMALL AND/OR DIM PICTURE

Substitute V30 and V31. Check associated B+ filter and decoupling components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M2. Check by substitution V26, V21, V27, V28 and V29. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check R118, C114, T4, T6A, and other associated circuit components.	Check C105, C106, C108, R109, R111, R112, R114 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V21, V26, V27, V28, V29, V30 and V31. Check picture tube Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V27, V28, V29, V30 and V31. Check R118, C114, T4, T6A, R117, C109 and other associated components.

GENERAL

RASTER SOUND NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PICTURE

Check by substitution V3, V4, V5, V6, V7, V8, V9 and V12. Check associated components. In case of UHF check V1, V2 and associated components.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

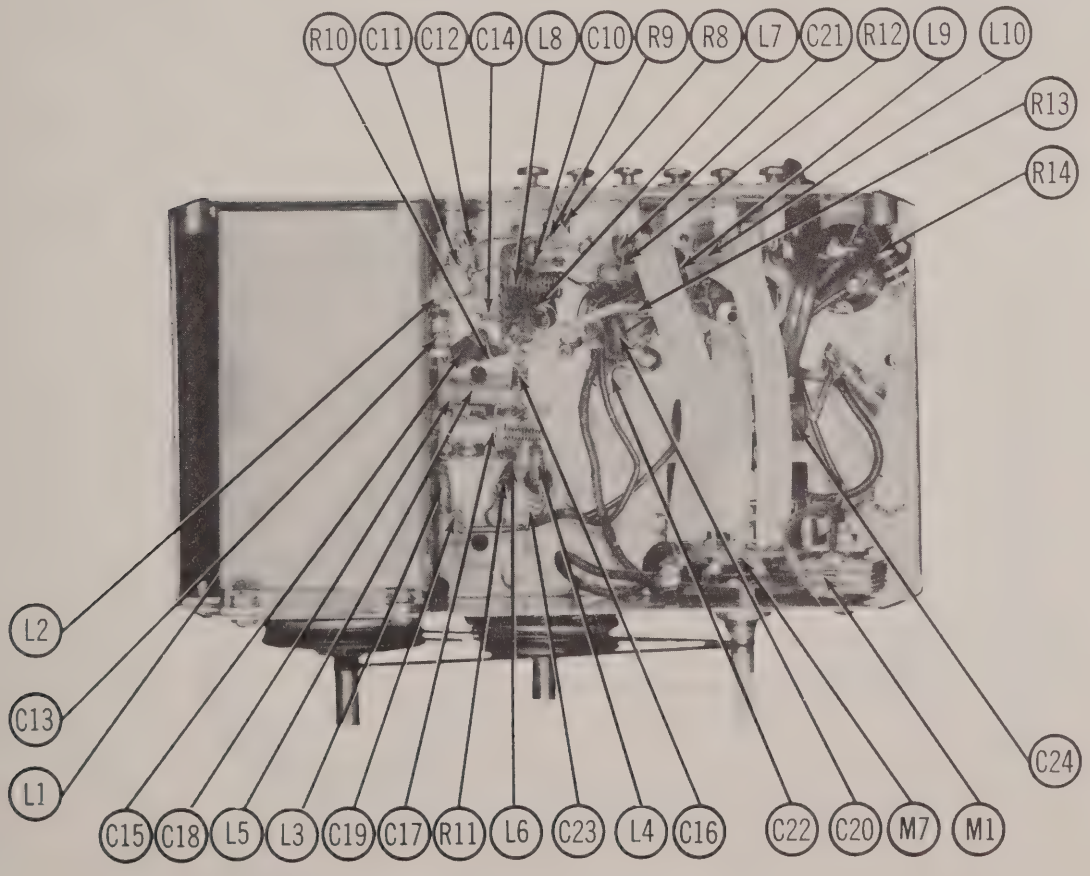
KEYSTONE EFFECT

Check T6, R93, R94 and C115.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



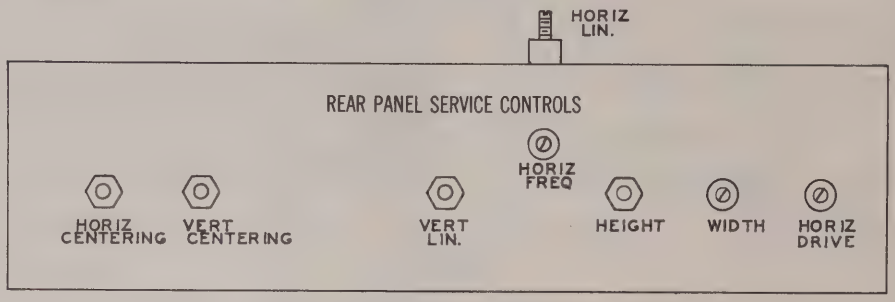
UHF TUNER BOTTOM VIEW

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at time, thru the small hole in the chassis to the right of the channel selector shaft.

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

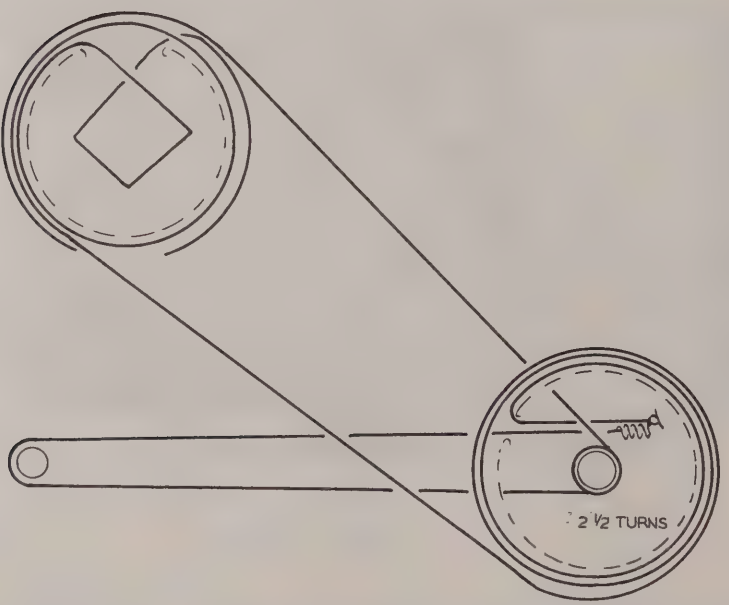
Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (L42) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

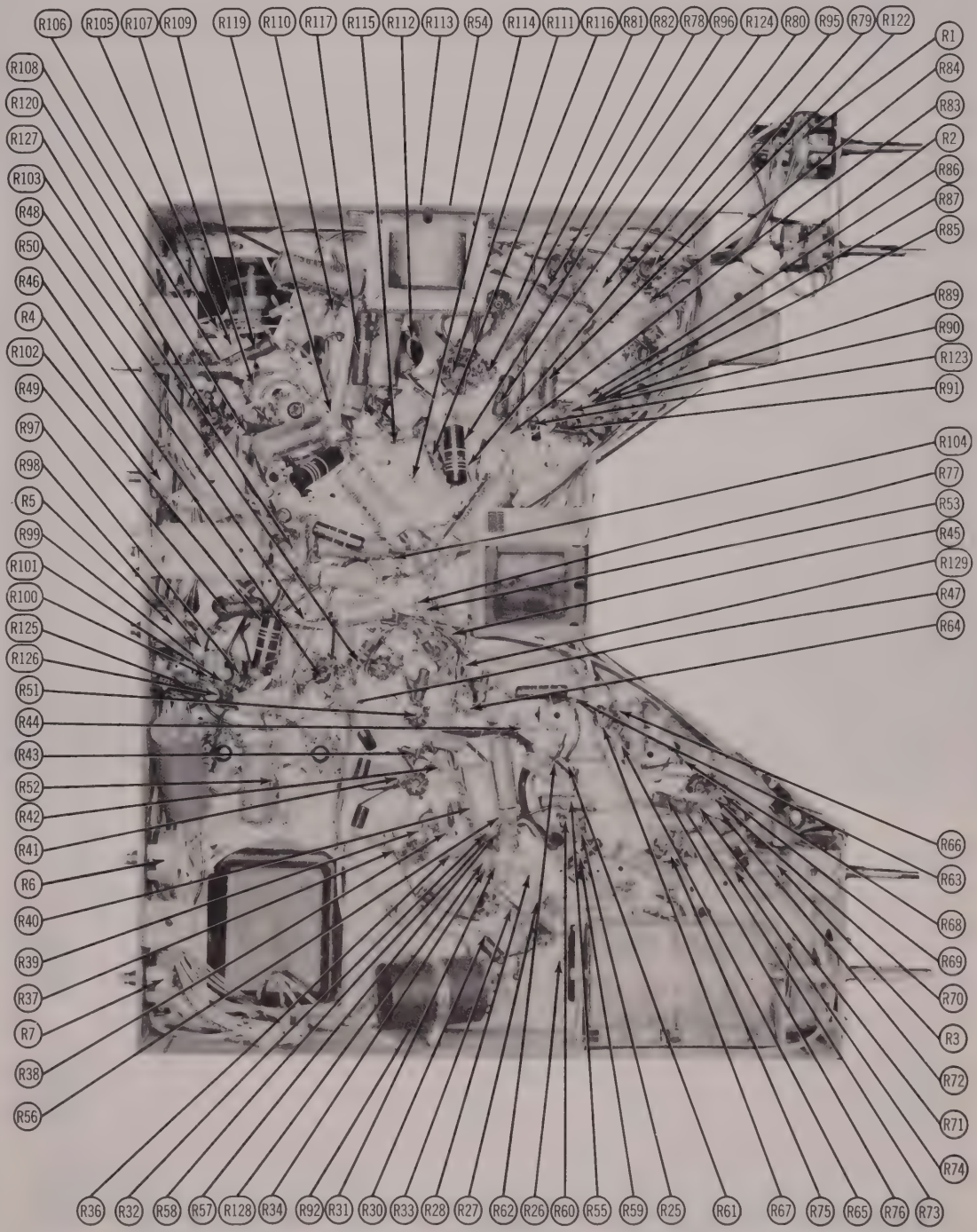
To eliminate sound IF detector buzz, adjust the ratio detector secondary (L41) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. For location see tube placement chart).



UHF DRIVE CORD STRINGING



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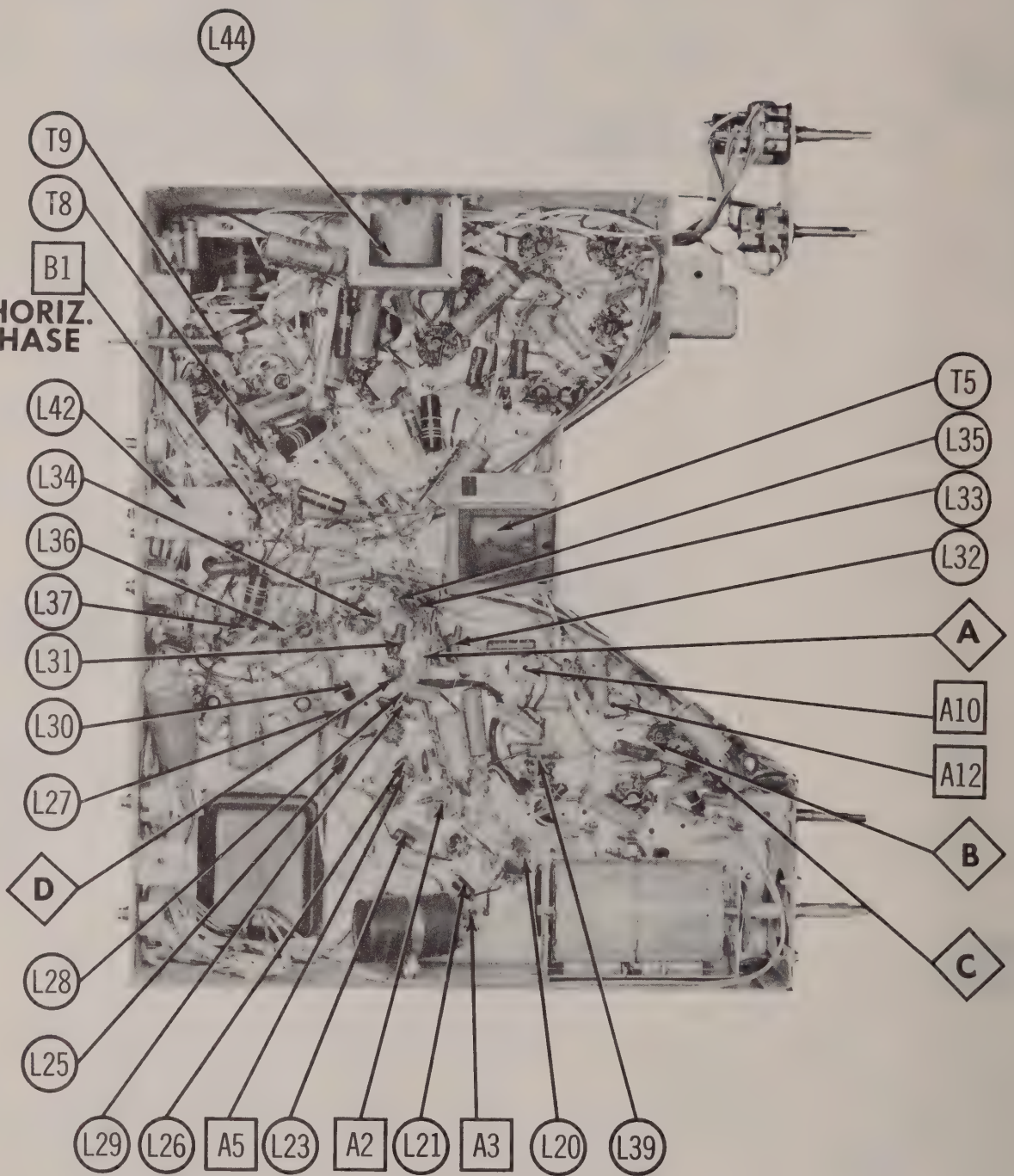

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MODEL A53

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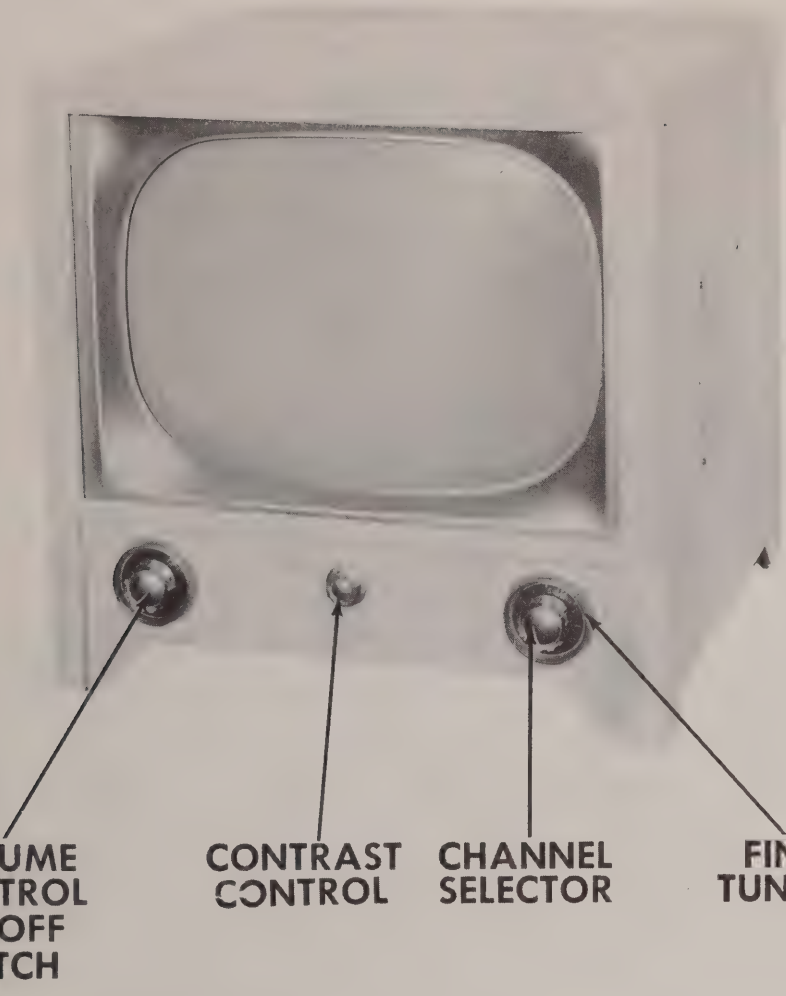

SETCHELL-CARLSON MODELS A53, A531, A533, A5301, A5302, A5303 (Ch. 153)

SETCHELL-CARLSON MODEL A53

TRADE NAME	Setchell-Carlson Model A53, A531, A533, A5301, A5302, A5303 (Ch. 153)
MANUFACTURER	Setchell-Carlson Inc., New Brighton, Minn.
TYPE SET	AM-TV Combination Receiver
TUBES	Twenty-eight
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.16 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13. Video IF 25.0MC, Sound IF 20.5MC (Intercarrier) AM Radio 535-1620KC, AM IF 455KC

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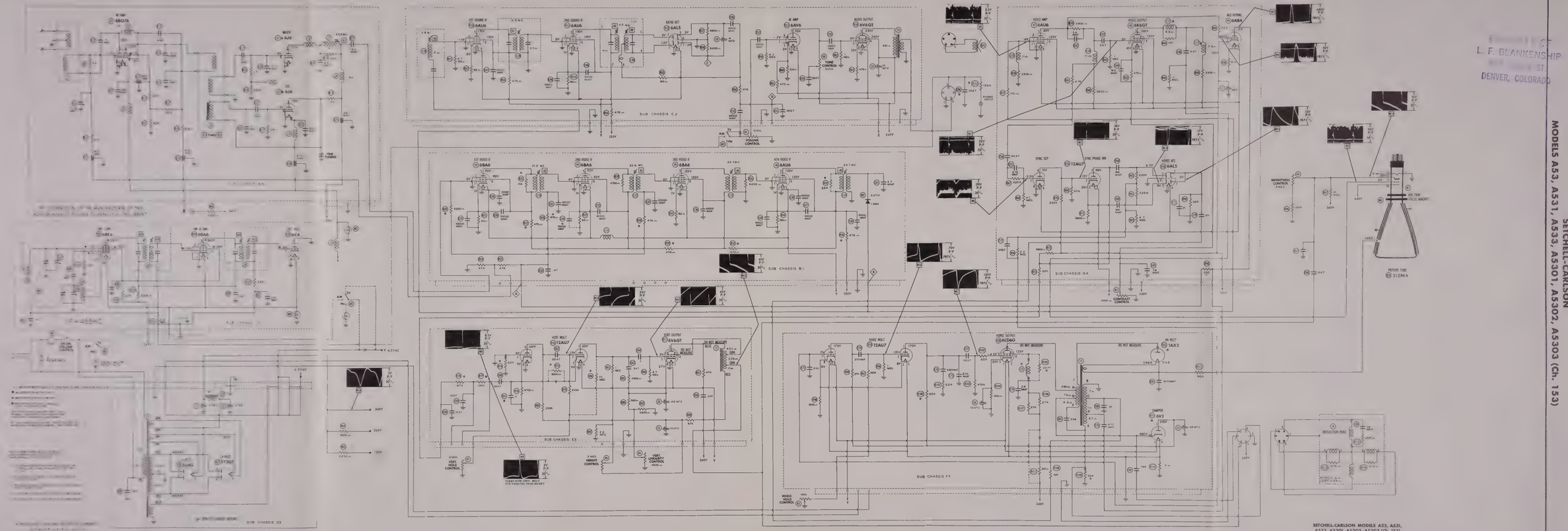

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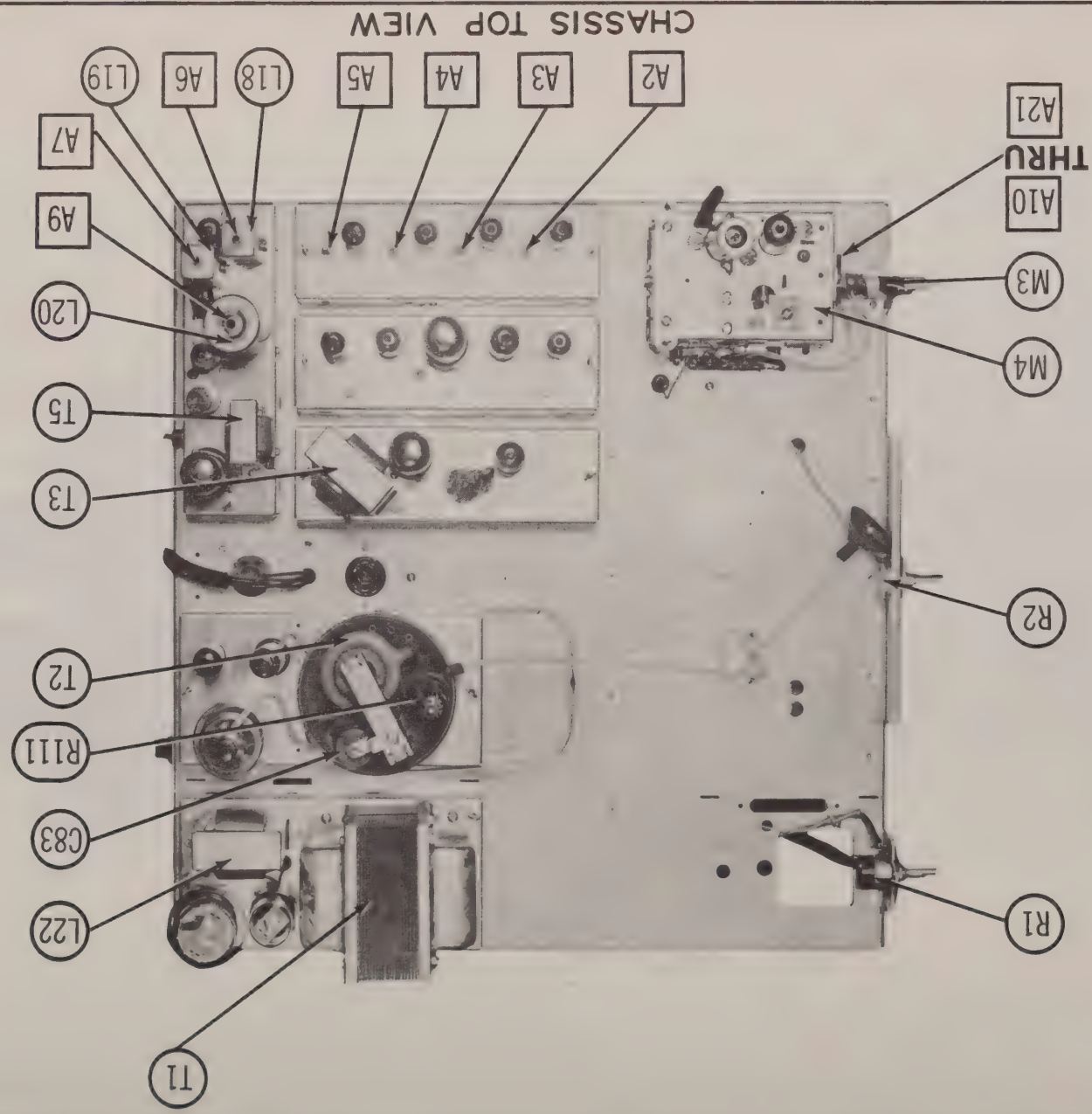
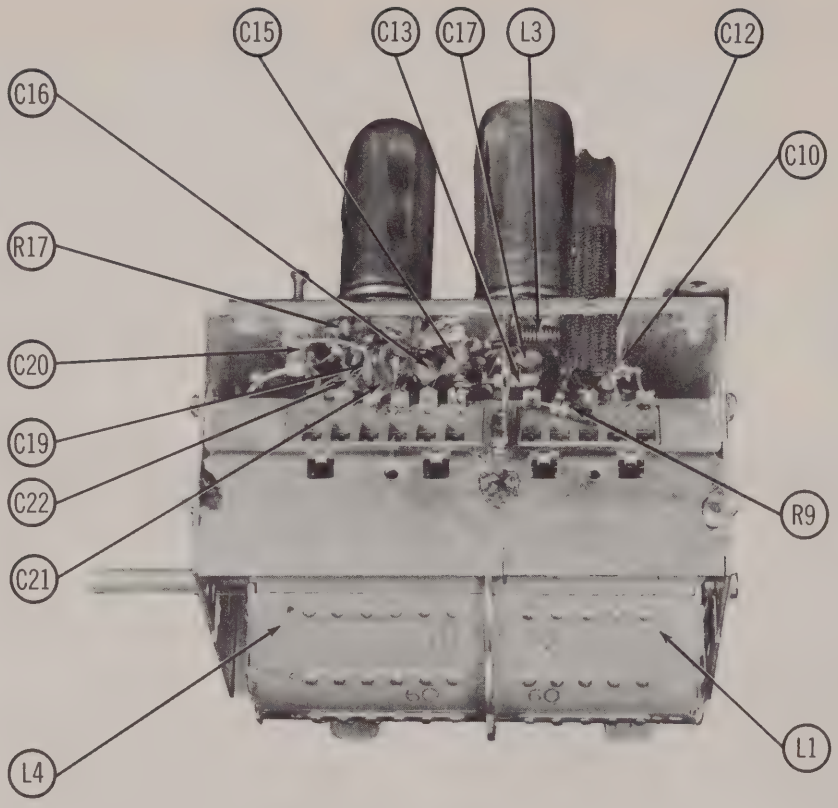
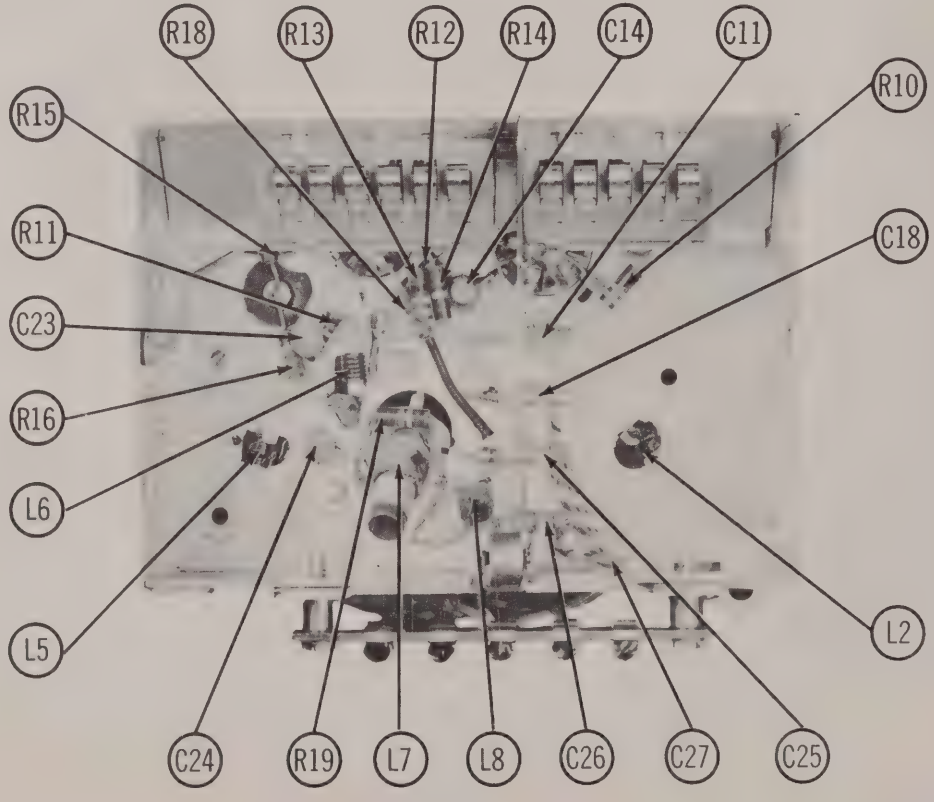




SUB-CHASSIS A 3



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TUBE PLACEMENT CHART

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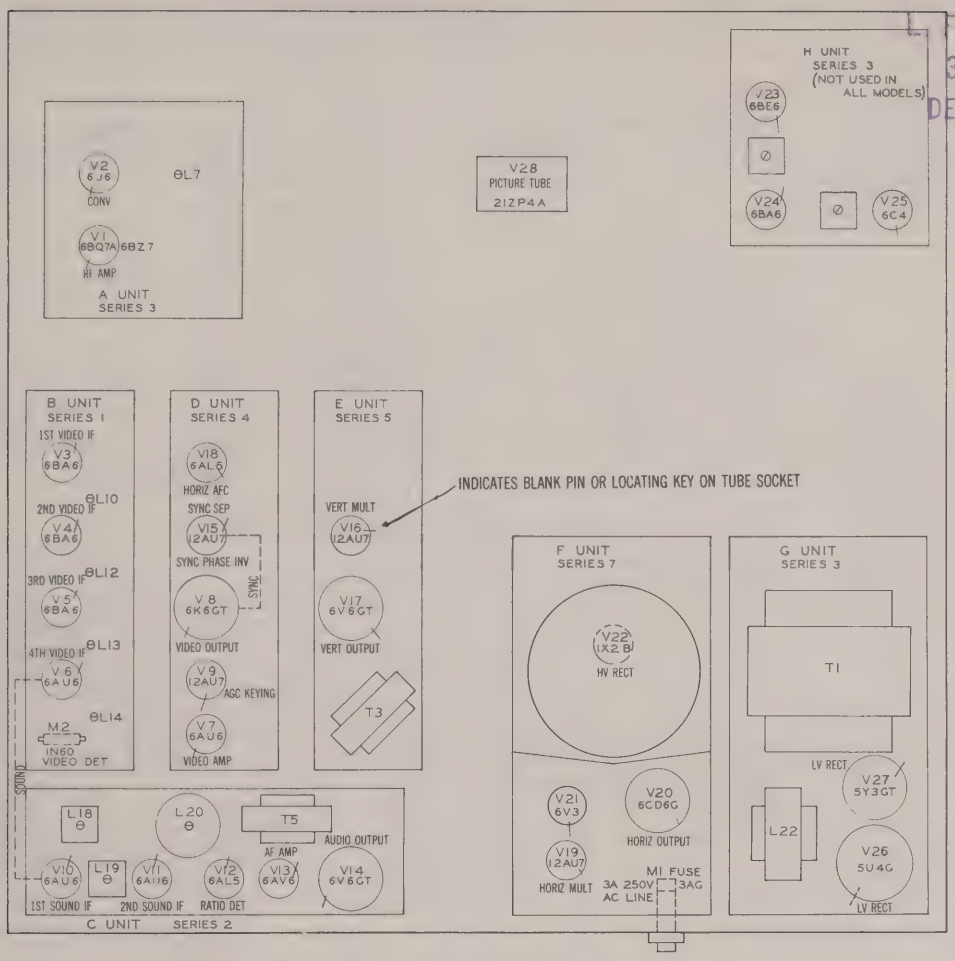

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V26, V27, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V8, V28
Has pic, no sound - V10, V11, V12, V13, V14
Overloaded picture - V9

SYNC FAILURE
No vert. sync - V15, V16
No horiz. sync - V15, V18, V19
No vert. or horiz. sync - V15

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V28
No vertical deflection - V16, V17
Poor vert. linearity or foldover - V16, V17
Poor horiz. linearity or foldover - V19, V20, V21
Narrow picture - V19, V20, V21, V22, V26, V27
Vert. off freq. - V15, V16
Horiz. off freq. - V15, V18, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has Pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt battery to point (A). Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	22.3MC (Unmod)	Any	DC probe thru 22KΩ to point (B). Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator output to maintain not more than 1.5 volts at VTVM.
2.	"	"	21.2MC	"	"	A2	"
3.	"	"	23.6MC	"	"	A3	"
4.	"	"	24.7MC	"	"	A4, A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23MC (10MC Swp)	20.5MC 25MC	Any	Vert. Amp. thru 22KΩ to point (B). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch A1 thru A5 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (C). Common to chassis.	A6, A7, A8	Adjust for maximum deflection. Attenuate generator output to maintain not more than 3 or 4 volts at VTVM.
7.	"	"	"	"	DC probe to point (D). Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60Ω modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to point (B). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (C). Low side to chassis.	A6, A7, A8	Disconnect stabilizing capacitor C9. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
7.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A9	Reconnect stabilizing capacitor C9. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

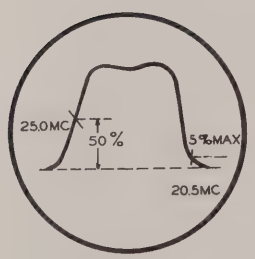

FIG.1

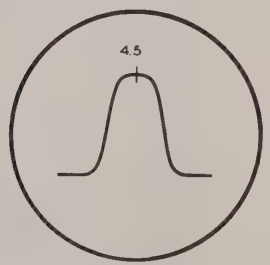

FIG.2

ALIGNMENT INSTRUCTIONS (cont)

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OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replcae the original 6J6 in it socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through the hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 22KΩ to point (B). Low side to chassis.	A10	Adjust to place video marker at 50% on response curve as in Fig. 4. Sound marker should be no higher than 5% on response curve.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A11	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A12	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A13	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A14	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A15	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A16	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A17	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A18	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A19	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A20	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A21	

RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

RADIO ALIGNMENT

Set "Radio Phono TV switch to "Radio" position .
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.01MFD	High side to pin 7 (grid) of 6BE6 (V24). Low side to chassis.	455KC (400%Mod)	Radio	Tuning gang Fully open	Across voice coil	A22,A23 A24,A25	Adjust for maximum deflection.
10.	"	"	1620KC	"	"	"	A26	"
11.		Loop	1500KC	"	Tune to 1500KC signal	"	A27	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

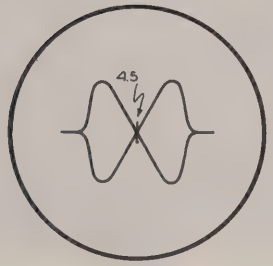


FIG. 3

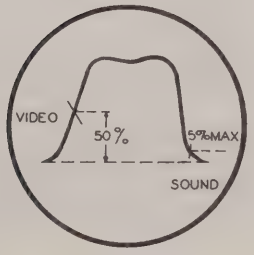
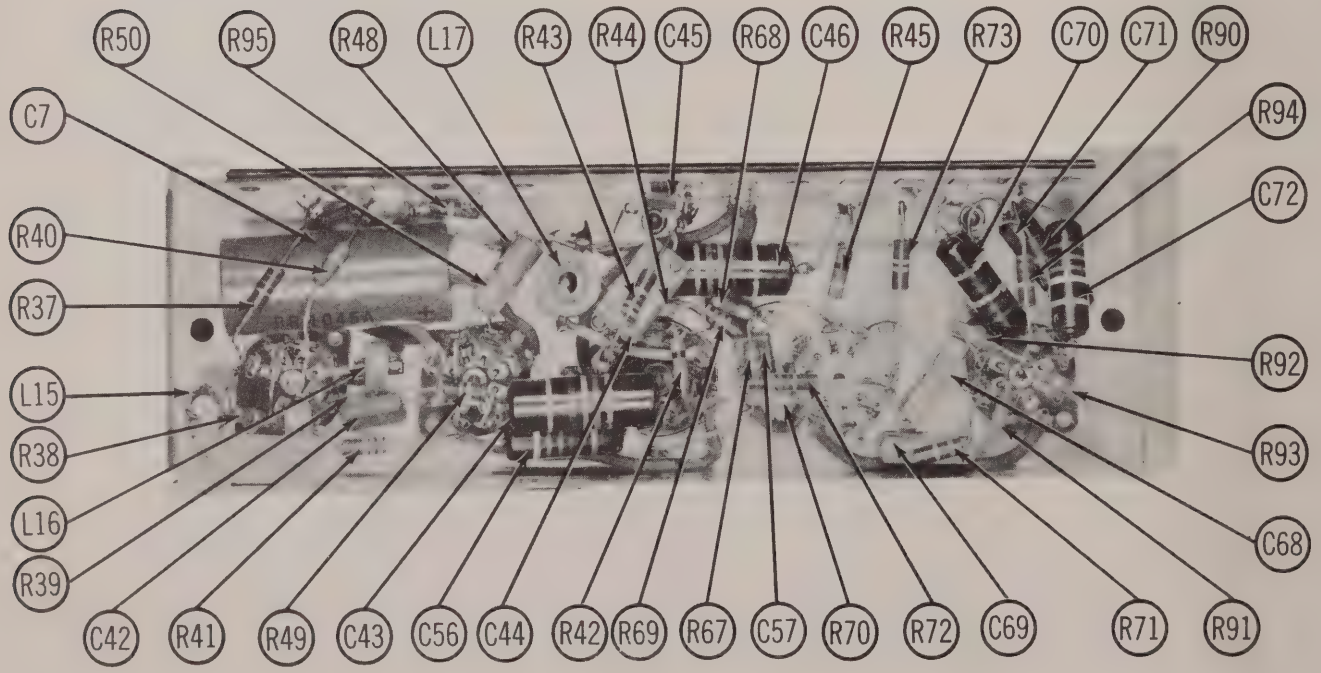


FIG. 4

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	95KΩ	0Ω	.1Ω	0Ω	†6.5KΩ	180KΩ	INF	0Ω
V 2	6J6	†17.3KΩ	†2.3KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6BA6	100KΩ	0Ω	.1Ω	0Ω	†4.2KΩ	†4.2KΩ	82Ω		
V 4	6BA6	95KΩ	0Ω	.1Ω	0Ω	†3.7KΩ	†3.7KΩ	82Ω		
V 5	6BA6	95KΩ	0Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	82Ω		
V 6	6AU6	.5Ω	0Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	180Ω		
V 7	6AU6	3.9KΩ	0Ω	0Ω	.1Ω	†10KΩ	†2.3KΩ	0Ω		
V 8	6K6GT	INF	0Ω	†5.5KΩ	†2.3KΩ	1Meg	4.9Meg	.1Ω	1.6KΩ	
V 9	6AB4	315KΩ	†2.3KΩ	0Ω	.1Ω	INF	†32KΩ	†2.3KΩ		
V 10	6AU6	4.7Meg	0Ω	0Ω	.1Ω	†3KΩ	†3KΩ	82Ω		
V 11	6AU6	3.5Ω	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	180Ω		
V 12	6AL5	INF	INF	0Ω	.1Ω	6.8KΩ	0Ω	6.8KΩ		
V 13	6AV6	4.7Meg	24Ω	0Ω	.1Ω	INF	INF	500KΩ		
V 14	6V6GT	0Ω	0Ω	†3.4KΩ	†3KΩ	1Meg	1Meg	.1Ω	470Ω	
V 15	12AU7	†9KΩ	47KΩ	5.6KΩ	.1Ω	.1Ω	†220KΩ	4.7Meg	0Ω	0Ω
V 16	12AU7	†1.1Meg	†1.2Meg	4.7KΩ	0Ω	0Ω	†270KΩ	0Ω	4.7KΩ	.1Ω
V 17	6V6GT	10KΩ	0Ω	†734Ω	†300Ω	4.7Meg	†270KΩ	.1Ω	6.1KΩ	
V 18	6AL5	22KΩ	22KΩ	0Ω	.1Ω	4.9Meg	0Ω	4.9Meg		
V 19	12AU7	†120KΩ	150KΩ	1.2KΩ	0Ω	0Ω	†27KΩ	6.9Meg	1.2KΩ	.1Ω
V 20	6CD6G	22KΩ	0Ω	300Ω	470KΩ	490KΩ	300Ω	.1Ω	†14KΩ	TOP CAP ▲7.5Ω
V 21	6V3	INF	†340Ω	INF	0Ω	.1Ω	INF	†340Ω	INF	†340Ω TOP CAP INF
V 22	1AX2	PINS		1 - 9	HAVE	INF	RESISTANCE			TOP CAP ▲270Ω
V 23	6BE6	22KΩ	.5Ω	0Ω	.1Ω	♦ †5.2KΩ	♦†30KΩ	♦2.7Meg		
V 24	6BA6	♦2.7Meg	0Ω	0Ω	.1Ω	♦ †5.2KΩ	♦†30KΩ	0Ω		
V 25	6C4	INF	INF	0Ω	.1Ω	0Ω	♦522KΩ	0Ω		
V 26	5U4G	INF	80KΩ	INF	48Ω	INF	45Ω	INF	80KΩ	
V 27	5Y3GT	INF	80KΩ	INF	45Ω	INF	48Ω	INF	80KΩ	
V 28	21ZP4A	0Ω	1Meg	PIN 10 †40Ω	PIN 11 150KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V28
▲ MEASURED FROM TOP CAP OF V21
♦ MEASURED IN RADIO POSITION



SUB CHASSIS D4

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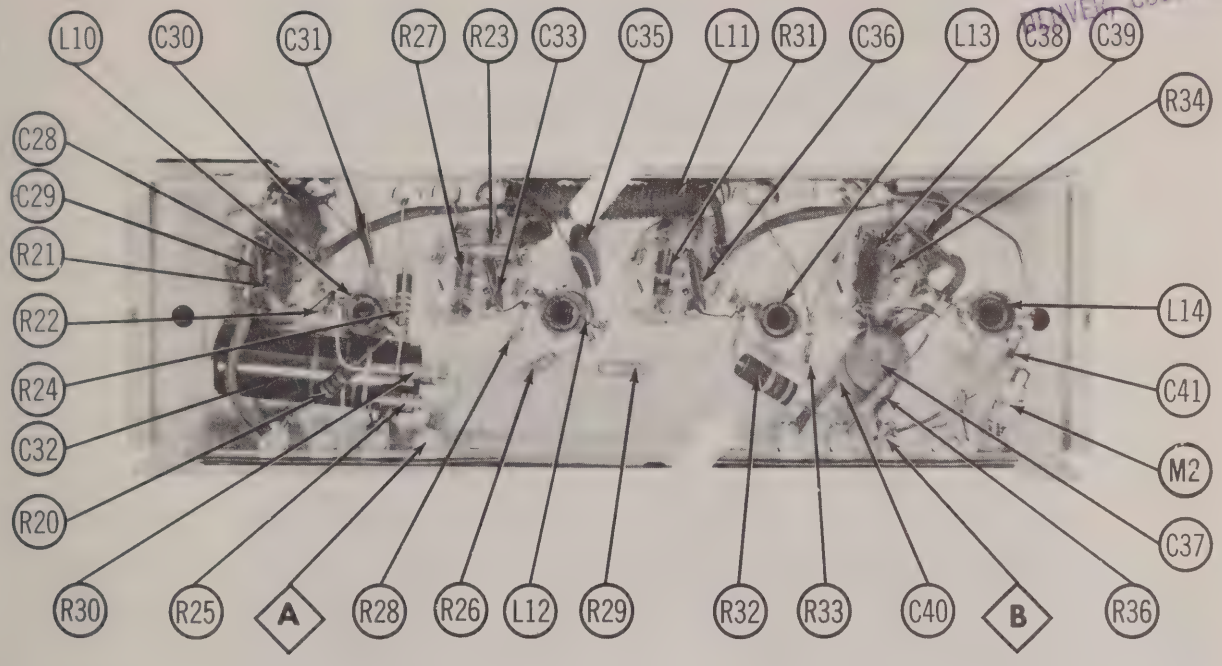
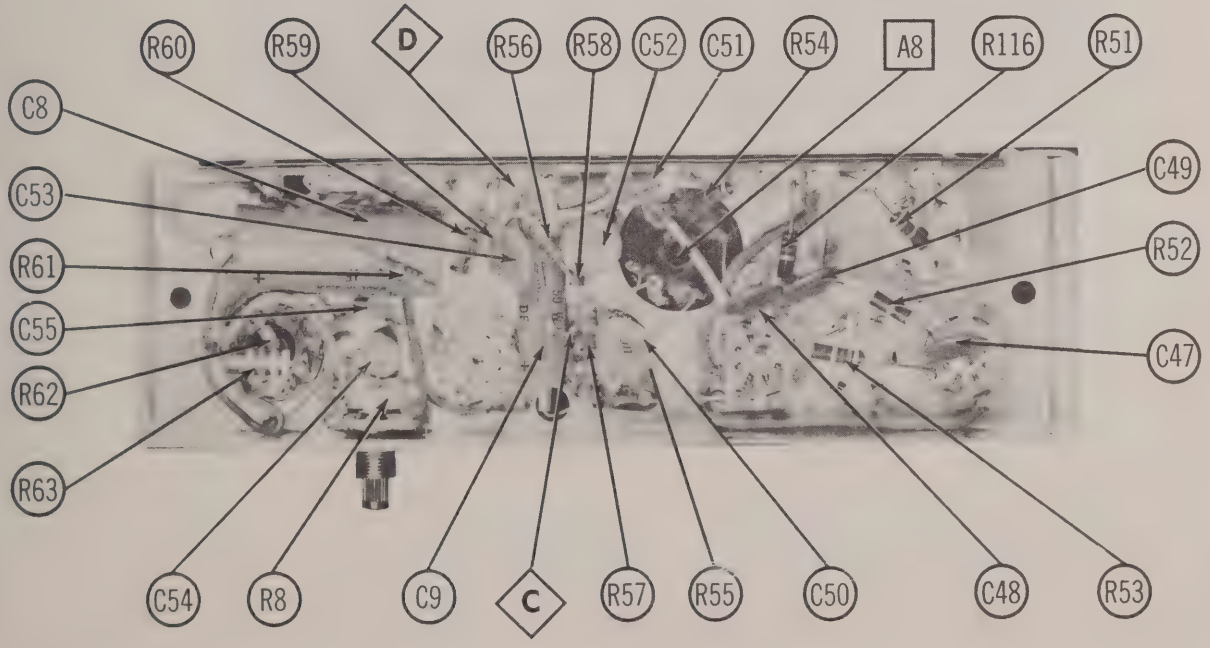
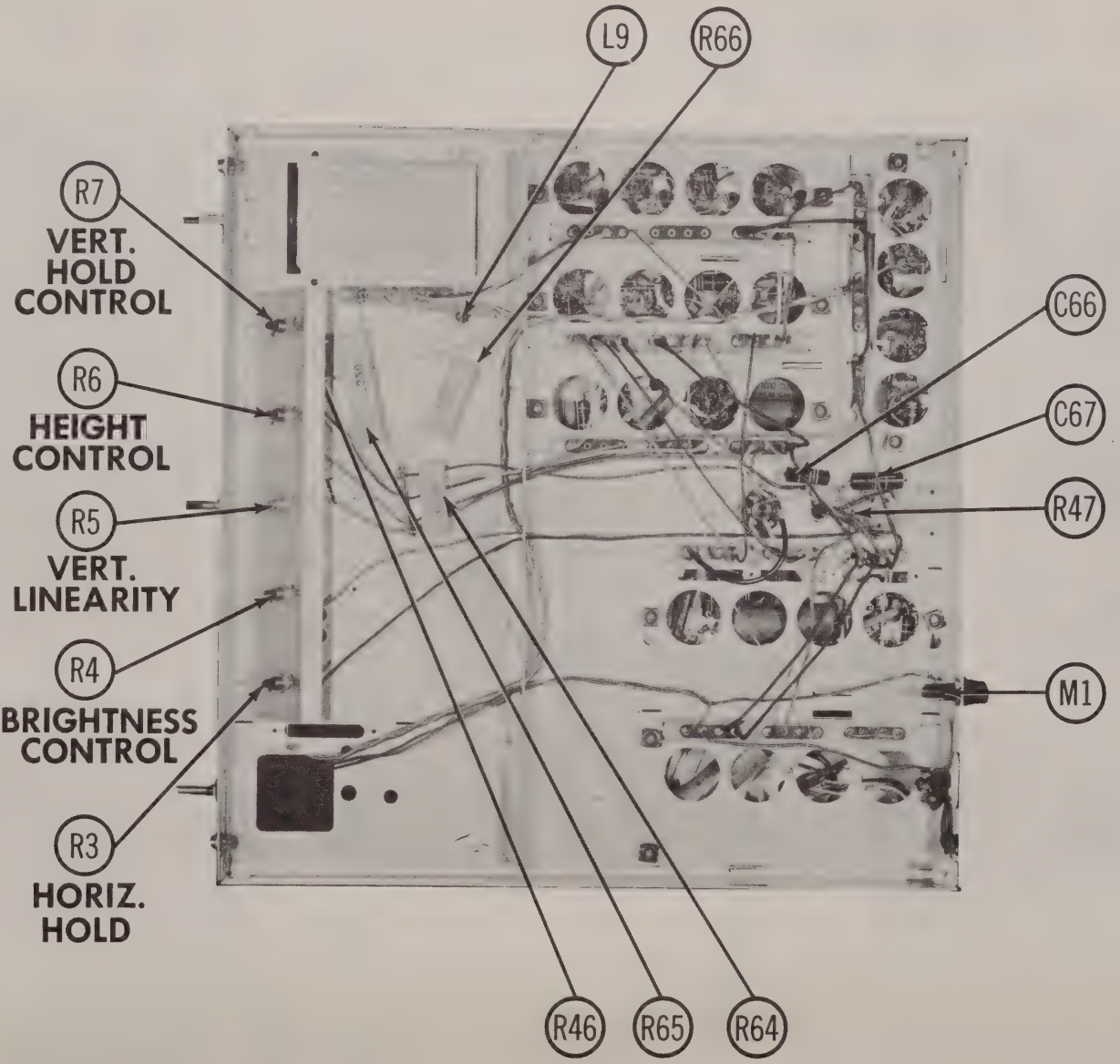


SUB-CHASSIS B1

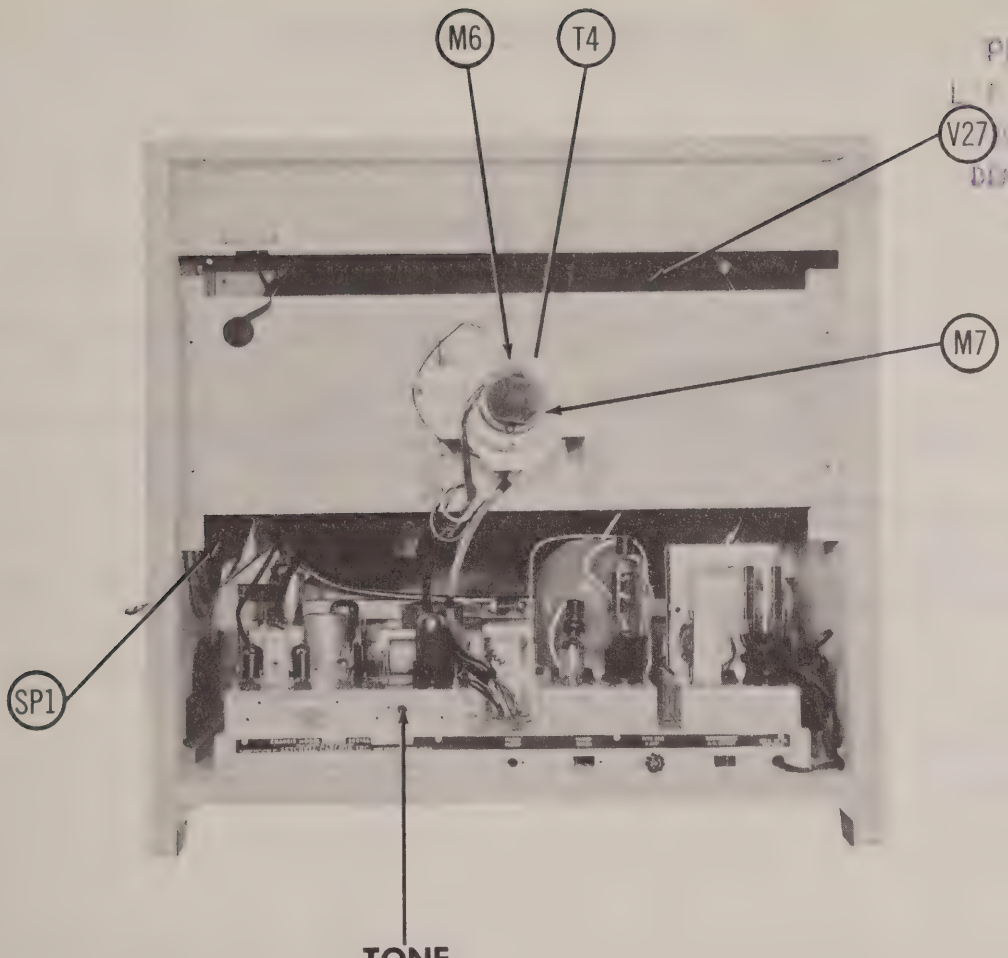


SUB-CHASSIS C2



CHASSIS BOTTOM VIEW

PROPERTY OF
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station.

Adjust the horizontal hold control to synchronize the picture horizontally.

If control must be turned fully clockwise or counter clockwise to sync the picture, or if slow warm-up causes the horizontal frequency to drift, replace V19 (12AU7).

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20, V21, V27 and V28. Check width adjustment on neck of picture tube. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T2, T4A, R106, R107, R104, C78, C81, C82 and other associated circuit components.	Check C75, C77, R99, R100, R103 and other associated components.

DRIVE LINES

Check by substitution V19, V20 and V21. Check T2, T4A, C81, C82, C84, R115, C75, C76, R100, R101 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V20 and V21. Check components associated with the horizontal output and damper stages especially T2 and T4A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check C73 for open. Check by substitution V20 and V21. Check T2 and T4A for internal arcing.

XMAS TREE EFFECT

Substitute V19. Check C74, R99, R98, R96, R97 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V16 and V17. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R88, R5 and other associated circuit components.	Check C64, R85, C62, R81, R89 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Follow procedure outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V16 and V17. Check T3, T4B, C6 and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V16 and V17. Check C63, C64, R84, R85 and other associated components.

FOLDS

Check by substitution V16 and V17. Check associated components including T3 and T4B for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Substitute V15. Check C56, R68, R69, R70, R72 and other associated components for failure or change of value.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Check by substitution V15 and V16. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check components associated with V16 especially C62, C61, R81 and R89.	Check vertical integrator network and other associated components. Check video and IF stages for overloading.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check components associated with V19 especially C74, C73, R99, R100 and R96.	Check C68, C69, R91 and R92.

HORIZONTAL BENDING

Check by substitution V18, V19 and V20. Check the horizontal AFC filter network for component failure or change of value.

VIDEO

LOSS OF VIDEO

Check by substitution V7, V8 and V9. Check video detector crystal. Check picture tube and other associated circuit components.

SOUND BARS (4.5MC Beat)

Adjust tuner fine tuning for best picture and sound. Check Video IF alignment.

POOR CONTRAST

Check by substitution V7 and V8. Check video detectory crystal, contrast control, picture tube and other associated circuit components.

NEGATIVE PICTURE

Check by substitution V7, V8, V9, V3, V4, V5 and V1. Check video detector crystal. Check AGC network components.

SMEAR

Check by substitution V7 and V8. Check video detector crystal. Check C43, C46, R39, R40, R50, R38, R42, L15, L16, L17, picture tube and other associated circuit components.

WIDE BLACK BAR ACROSS PICTURE

Check V1, V3, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11, V12, V13 and V14. Check stages V13 and V14 using audio signal generator. Apply audio signal across R59.

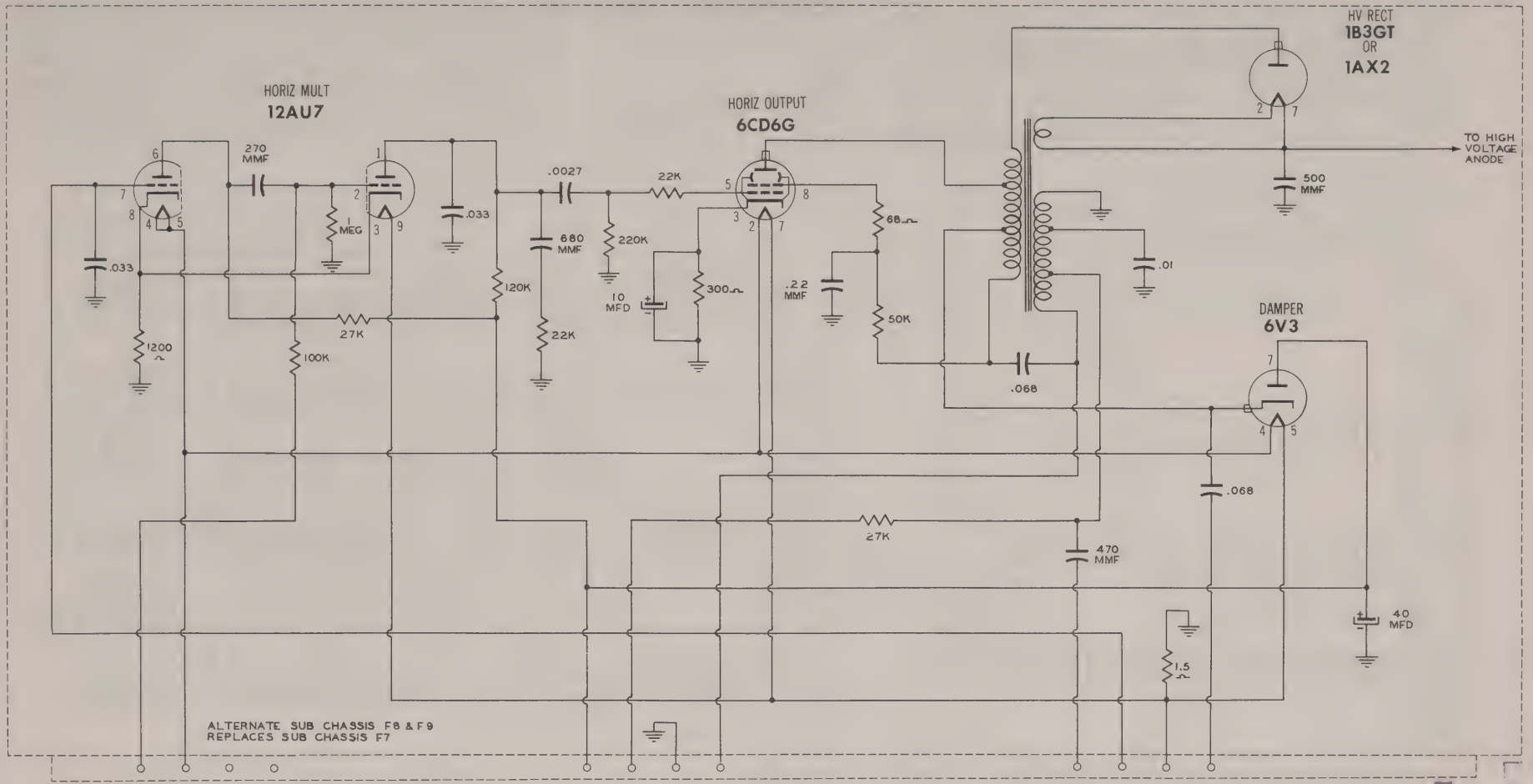
If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V13 and V14 especially C53, C55 and T5.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A9 for minimum buzz. If still unsatisfactory, substitute V12 and realign ratio detector and audio IF stages.

DISTORTED

Follow procedure outlined under "Weak or No Sound".



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE SUB-CHASSIS F8 & F9

SETCHELL-CARLSON

MODELS A53, A531, A533, A5301, A5302, A5303 (Ch. 153)

PROPERTY OF
L. F. ANNENBERG
3824 MAPLE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: Setchell Carlson Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6BA6	6BA6	7BK	
V4	2nd Video IF Amp.	6BA6	6BA6	7BK	
V5	3rd Video IF Amp.	6BA6	6BA6	7BK	
V6	4th Video IF Amp.	6AU6	6AU6	7BK	
V7	Video Amplifier	6AU6	6AU6	7BK	
V8	Video Output	6K6GT	6K6GT	7B	
V9	AGC Keying	6AB4	6AB4	5CK	
V10	1st Sound IF Amp.	6AU6	6AU6	7BK	
V11	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier	6AV6	6AV6	7BT	
V14	Audio Output	6V6GT	6V6GT	7B	
V15	Sync Separator-Sync Phase Inv.	12AU7	12AU7	9A	
V16	Vertical Mult.	12AU7	12AU7	9A	
V17	Vertical Output	6V6GT	6V6GT	7B	
V18	Horizontal AFC	6AL5	6AL5	6BT	
V19	Horizontal Mult.	12AU7	12AU7	9A	
V20	Horizontal Output	6CD6G	6CD6G	5BT	
V21	Damper	6V3	6V3	9BD	
V22A	HV Rectifier	1AX2	1AX2	9Y	
B	HV Rectifier	1X2B	1X2B	9Y	
C	HV Rectifier	1B3GT	1B3GT	8C	
V23	AM Converter	6BE6	6BE6	7CE	
V24	AM IF Amplifier	6BA6	6BA6	7BK	
V25	AM Det. -AVC	6C4	6C4	6BG	
V26	LV Rectifier	5U4G	5U4G	5T	
V27	LV Rectifier	5Y3GT	5Y3GT	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: Setchell-Carlson Part No.	CBS-HYTRON Part No	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	WESTINGHOUSE Part No.	RETMA BASE TYPE	NOTES
V28	21ZP4A	21ZP4A 21ZP4B	21ZP4B ①	21ZP4A 21ZP4B ① 21ZP4 ②	21ZP4A	12N 12N	① Aluminized ② Circuit changes necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	RATING: VOLT	Setchell Carlson Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: SPRAGUE Part No.	NOTES
C1	40	450		PRS450-40		BR4045		TC78	TVA-1712	
C2	40	450		PRS450-40		BR4045		TC78	TVA-1712	
C3	40	450		PRS450-40		BR4045		TC78	TVA-1712	
C4	10	50		PRS50/10		BR106		TC321	TVA-1304	
C5	10	450		PRS450/10		BR1045		TC72	TVA-1705	
C6	100	50		PRS50-100		BRH501		TC3501	TVA-1310	
C7	10	450		PRS450-10		BR1045		TC72	TVA-1705	
C8	10	450		PRS450/10		BR1045		TC72	TVA-1705	
C9	4	50		PRS150/4		BBR4-50T		TC30	TVA-1303	
C10	3-8				829-10					
C11	800			EF-001	MFT-1000					503C-D1
C12	3			SIJNP0	TCZ-3	Z007	MP0K-030	ZT-553	STCCB-V33	503C-D1
C13	800			EF-001	MFT-1000					
C14	.5-3				829-3		3115-01-0R5	CT585A		
C15	1.5			SIL5NP0	TCZ-1.5	Z004	MP0K-1R5	ZT-555	STCCB-V15	
C16	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C17	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C18	800			EF-001	MFT-1000					503C-D1
C19	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C20	.5-3				829-3		3115-01-0R5	CT585A		
C21	10			SIJNP0	TCZ-10	Z018	MP0K-100	ZT-541	STCC-J1	
C22	5				TCN-5	N011	N750K-050	NT-555	STCUB-Y5	
C23	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C24	6.8			SIS.5NP0	TCZ-6.8	Z013	MP0K-6R8	ZT-5568	STCCB-V68	
C25	800			EF-001	MFT-1000					503C-D1
C26	800			EF-001	MFT-1000					503C-D1
C27	120			BPD-0001Z	D6-121	G044	GP2K-121	UC-5313	5GA-T12	
C28	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C29	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C30	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C31	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C32	.47	200		P288-47		CUB2P47		PT4047	2TM-P47	
C33	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C34	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	Note 1
C35	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C36	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C37	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C38	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C39	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C40	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C41	4.7			SI4.5NP0	TCZ-4.7	T207	MP0K-4R7	ZT-555	STCCB-V47	
C42	56	500				22R5Q56				
C43	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C44	910	500				1R5T91				
C45	56	500				22R5Q56				
C46	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C47	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C48	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C49	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C50	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C51	.0027	400		SI2700	D6-272	TP59	GP2L-272	UC-5327	5HK-D27	
C52	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C53	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	Setchell-Carlson Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: SPRAGUE Part No.	NOTES
C54	.0047	400		P588-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C55	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1	
C56	.0047	400		P588-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C57	270	500								
C58	.0027	400		SI2700	D6-272	TP59	GP2L-272	UC-5327	5HK-D27	
C59	.0047	400		P588-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C60	.0047	400		P588-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C61	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT401	4TM-S1	Note 2
C62	.0047	400		P588-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C63	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C64	.1	600		P568-1	DF-104	CUB6P1		PT601	6TM-P1	
C65	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C66	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C67	.1	400		P468-1	DF-104	CUB4P1		PT401	4TM-P1	
C68	910	500				1R5T91				
C69	910	500				1R5T91				
C70	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C71	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C72	.0027	400								
C73	.033	400		P568-033		CUB6S33		PT633	6TM-S33	
C74	270	500				1R5T27				
C75	270	500				1R5T27				
C76	680	500		1469-0007		1R5T68				
C77	.0027	400								
C78	.22	400		P488-22		CUB4P22		PT4022	4TM-P22	
C79	470			HVD30-00047			3KV-47L		20GA-T47	
C80	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C81	.068	1000								
C82	.068	1000								
C83	500	20000		HV30C	TV3-502	MMU20T5	413	HV20035A	30DK-T5	
C84	56	2000					3KV-560		20GA-Q56	
C85	.047	400		489ZX-05	DF-503	CUB4S47		PT4147	4TM-S47	
C86	.0027			SI2700	D5-272		GP2L-272	UC-5327	5HK-D27	Note 1
C87	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C88	100			BPD-0001	D6-101	G042	81L-101	UC-531	5GA-T1	
C89	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C90	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C91	250			SI250	D6-251	G053	81L-151	UC-5335	5GA-T25	

Note 1. Not used in all Models.
Note 2. Some models use .047MFD in this application.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Setchell-Carlson Part No.	REPLACEMENT DATA: IRC Part No.	REPLACEMENT DATA: CLAROSTAT Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: MALLORY Part No.	INSTALLATION NOTES
R1A	500KΩ	½	TV1-60	Q13-133	A47-500K-Z	B-60-S	U-42	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	4000Ω	½	TV1-41	Q11-414	A47-4000-S	AB-D	U-14	Contrast
B	Shaft		Not Req.	Not Req.	FS-3	AK-3	Not Req.	Attach to R2A
R3A	100KΩ	½	TV1-62A	Q11-128	A47-100K-S	AB-40	SU-41	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R3A
R4A	2 Meg	½	TV1-51-5	Q11-139	A47-2Meg-S	AB-75	SU-56	Brightness
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R4A
R5A	4000Ω	½	TV1-41-S2A	Q11-414	A47-4000-S	AB-D	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R5A
R6A	2 Meg	½	TV1-51-5	Q11-139	A47-2Meg-S	AB-75	SU-56	Height
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R6A
R7A	2 Meg	½	TV1-51-5	Q11-139	A47-2 Meg-S	AB-75	SU-56	Vert. Hold
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R7A
R8A	500KΩ	½	TX-1B-1	Q13-133	A47-500K-Z	AB-60	U-42	Tone
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R8A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Setchell-Carlson Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R9	15KΩ	½		BTS-15K	
R10	47KΩ	½		BTS-47K	
R11	160KΩ	½		BTS-160K	
R12	100KΩ	½		BTS-100K	
R13	100KΩ	½		BTS-100K	
R14	1500Ω	½		BTS-1500	
R15	10KΩ	½		BTS-10K	
R16	220KΩ	½		BTS-220K	
R17	10KΩ	½		BTS-10K	
R18	15KΩ	½		BTS-15K	
R19	22KΩ	½		BTS-22K	
R20	8200Ω	½		BTS- 8200	Note 1
R21	82Ω	½		BTS-82	
R22	15KΩ	½		BTS-15K	Note 2
R23	470Ω	½		BTS-470	Note 3
R24	47KΩ	½		BTS-47K	
R25	47KΩ	½		BTS-47K	
R26	470Ω	½		BTS-470	note 3
R27	82Ω	½		BTS-82	
R28	4700Ω	½		BTS-4700	
R29	470Ω	½		BTS-470	Note 3
R30	470Ω	½		BTS-470	Note 3
R31	82Ω	½		BTS-82	
R32	470Ω	½		BTA-470	Note 3
R33	8200Ω	½		BTS-8200	
R34	180Ω	½		BTS-180	
R35	22KΩ	½		BTS-22K	Note 4
R36	470Ω	½		BTS-470	Note 5
R37	150Ω	½		BTS-150	
R38	3900Ω	½		BTS-3900	
R39	3900Ω	½		BTS-3900	
R40	3900Ω	½		BTS-3900	
R41	47KΩ	½		BTS-47K	
R42	1 Meg	½		BTS-1 Meg	
R43	470Ω	½		BTS-470	
R44	15KΩ	½		BTS-15K	
R45	1 Meg	½		BTS-1 Meg	
R46	100KΩ	½		BTS-100K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Setchell-Carlson Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R47	10 Meg	½		BTS-10 Meg	
R48	10Ω	½		BTS-10	
R49	22KΩ	½		BTS-22K	
R50	3300Ω	1		BTA-3300	
R51	4.7Meg	½		BTS -4.7Meg	
R52	82Ω	½		BTS-82	
R53	470Ω	½		BTS-470	
R54	470Ω	½		BTS-470	
R55	180Ω	½		BTS-180	
R56	47KΩ	½		BTS-47K	
R57	6800Ω	½		BTS-6800	
R58	6800Ω	½		BTS-6800	
R59	4.7Meg	½		BTS- 4.7Meg	
R60	24Ω	½		BTS- 24	
R61	470Ω	½		BTS-470	
R62	1 Meg	½		BTS-1 Meg	
R63	470Ω	1		BTA-470	
R64	3000Ω	10		1 3/4A-3000	
R65	2250Ω	30		2D-2250	
R66	5000Ω	5		1 3/4A-5000	
R67	220KΩ	½		BTS-220K	
R68	4.7Meg	½		BTS- 4.7Meg	
R69	47KΩ	½		BTS 47K	
R70	220KΩ	½		BTS-220K	
R71	5600Ω	½		BTS-5600	
R72	6800Ω	½		BTS-6800	
R73	22KΩ	½		BTS-22K	
R74	22KΩ	½		BTS-22K	Note 4
R75	8200Ω	½		BTS-8200	Note 4
R76	4700Ω	½		BTS-4700	
R77	100KΩ	½		BTS-100K	Note 8
R78	47KΩ	½		BTS-47K	Note 8
R79	470KΩ	½		BTS-470K	
R80	10 Meg	½		BTS-10 Meg	Note 4
R81	1 Meg	½		BTS-1 Meg	
R82	2.2Meg	½		BTS-2.2Meg	
R83	5600Ω	½		BTS-5600	
R84	4.7 Meg	½		BTS-4.7Meg	

RESISTORS (cont)

ITEM No	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Setchell-Carlson Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R85	3900Ω	½		BTS 3900	
R86	560Ω	½		BTS-560	
R87	47KΩ	½		BTS-47K	
R88	47KΩ	½		BTS-47K	
R89	220KΩ	½		BTS-220K	
R90	22KΩ	½		BTS-22K	
R91	220KΩ	½		BTS 220K	
R92	220KΩ	½		BTS 220K	
R93	4.7Meg	½		BTS- 4.7Meg	
R94	2.2Meg	½		BTS-2.2Meg	
R95	220KΩ	½		BTS-220K	
R96	1 Meg	½		BTS-1 Meg	
R97	100KΩ	½		BTS-100K	
R98	1200Ω	½		BTS-1200	
R99	27KΩ	3		BTB-27K	
R100	120KΩ	½		BTS-120K	Note 7
R101	22KΩ	½		BTS-22K	
R102	22KΩ	½		BTS-22K	
R103	470KΩ	½		BTS-470K	

ITEM No	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Setchell-Carlson Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R104	300Ω	5		1 3/4A-300	
R105	22Ω	1		BTS-22	Note 8
R106	27KΩ	3		BTB-27K	
R107	27KΩ	3		BTB-27K	
R108	10KΩ	1		BTA-10K	
R109	50KΩ	10		2D-50K	
R110	1 50	½			
R111	1 Meg	½		BTS-1 Meg	
R112	100KΩ	½		BTS-100K	Note 4
R113	470Ω	½		BTS 470	
R114	470Ω	½		BTS-470	
R115	1200Ω	½		BTS-1200	
R116	180Ω	½		BTS-180	
R117	300Ω	5		1 3/4A-300	
R118	22KΩ	½		BTS-22K	
R119	2200Ω	½		BTS-2200	
R120	27KΩ	2		BTB-27K	
R121	2.2Meg	½		BTS-2.2Meg	
R122	22KΩ	½		BTS-22K	

Note 1. Some models may use a 3900Ω resistor in this application.
Note 2. Some models may use a 22KΩ resistor in this application.
Note 3. Some models may use a 180Ω resistor in this application.
Note 4. Not used in all models.
Note 5. Some models may use a 270Ω resistor in this application.
Note 6. Some models may use a 8200Ω resistor in this application.
Note 7. Some models may use a 100KΩ resistor in this application.
Note 8. Some models may use 3 Microhenries RF choke in this application (L21).

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: Setchell Carlson Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	RCA TYPE No.	Halldorson Part No.	Thordarson Part No.
T1	117VAC	684VCT @2.16A	5VAC @3A	MS76-D			-			26R00① ②
	SEC. 3	SEC. 4	SEC. 5							
	5VAC @3A	6.3VAC @10.7A	-							

① Use universal mounting brackets.
② Parallel and phase four 6.3V @ 3A windings for Sec. #4.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Setchell-Carlson Part No	Stancor Part No	Merit Part No	Triad Part No	RCA TYPE No	Halldorson Part No	Thordarson Part No
T2	Horiz.Output Trans.	52-B-18A ①						
T3	Vert. Output Trans.	M737						
T4A	Yoke-Horiz.(60MH)	FA53-102	DY-2A	MDF-70	Y-21-1	206D1	DF601	Y5
B	Yoke-Vert. (37MH)							

① Windings only.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC	Setchell-Carlson Part No	Stancor Part No	Merit Part No	Triad Part No	Halldorson Part No	Thordarson Part No	NOTES
T5	6.5KΩ	3.4Ω	MS81	A-3877	A-2931	S-3X	Z1001	TS-24S51	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: Setchell-Carlson Part No.	VIKING Part No.	QUAM Part No.	NOTES
SP1	10"	PM	3.4Ω	TV-121-10	10J11	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES: PRI.	DC RES: SEC.	REPLACEMENT DATA: Setchell-Carlson Part No	MEISSNER Part No	MERIT Part No.	MILLER Part No.	NOTES
L1	Ant.Coils	0ΩCT	0Ω					
L2	Osc. Coil	0Ω						
L3	Neutr.Coil	0Ω						
L4	RF, Mixer Grid & Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Choke	0Ω						
L7	1st. Video IF	1Ω						
L8	RF Choke	1.4Ω						
L9	Fil. Choke	0Ω						
L10	2nd. Video IF	.8Ω	.5Ω	B72A83-3	17-1066	TV-116	6349	
L11	Fil. Choke	0Ω		FC103				
L12	3rd.Video IF	.8Ω	.5Ω	B72A83-3	17-1063	TV-116	6349	
L13	4th. Video IF	.8Ω	.5Ω	B72A83-3	17-1063	TV-116	6349	
L14	5th. Video IF	.5Ω	.5Ω	B72A83-3	17-1063	TV-116	6249	
L15	Shunt Peaking Coil	1ΩΩ		D-2000	19-3250	TV-185	6181	245 Microhenries
L16	Shunt Peaking Coil	1ΩΩ		D-2000	19-3250	TV-185	6181	345 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Setchell-Carlson PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L17A	Series Peaking Coil	6.5Ω		TV-121-3	19-3180	TV-184	6180	190 Microhenries
B	Shunt Peaking Coil	7.5Ω			19-3180	TV-184	6180	190 Microhenries
L18	1st. Sound IF	5Ω		C4501	17-1025 ■			
L19	2nd. Sound IF	.8Ω	3.7Ω	C4502	16-3445	TV-108 *	1466 *	
L20	Ratio Det.	4Ω	.9ΩCT	B13M19643	17-3493	TV-115 ▲	6205 ▲	Tertiary winding -.5Ω
L21	RF Choke	.3Ω			19-1002		4606	3 Microhenries -Note 1
L23	AM Ant. Coil	0Ω	.5Ω	HR-1				
L24	AM Osc. Coil	5Ω		416-C	14-1033	BC-400	5481-C	Tapped ⓖ.5Ω
L25	AM Input IF	1Ω	1Ω	570-455	16-6666 †	BC-368 †	1312-C1 †	
L26	AM Output IF	1Ω	1Ω	570-455	16-6667 †	BC-371 †	1312-C1 †	

Note 1. Some models may use 22Ω resistor in this application (R105)
■ Disregard tap on winding.
* Drill one new mounting hole.
▲ Use adaptor plate
† Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: Setchell-Carlson PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L22	.280ADC	38.4Ω	2 Hy.	M571	C-2326①		C-23X ①	C5037①	T26C44①

① Drill one new mounting hole.

FUSES

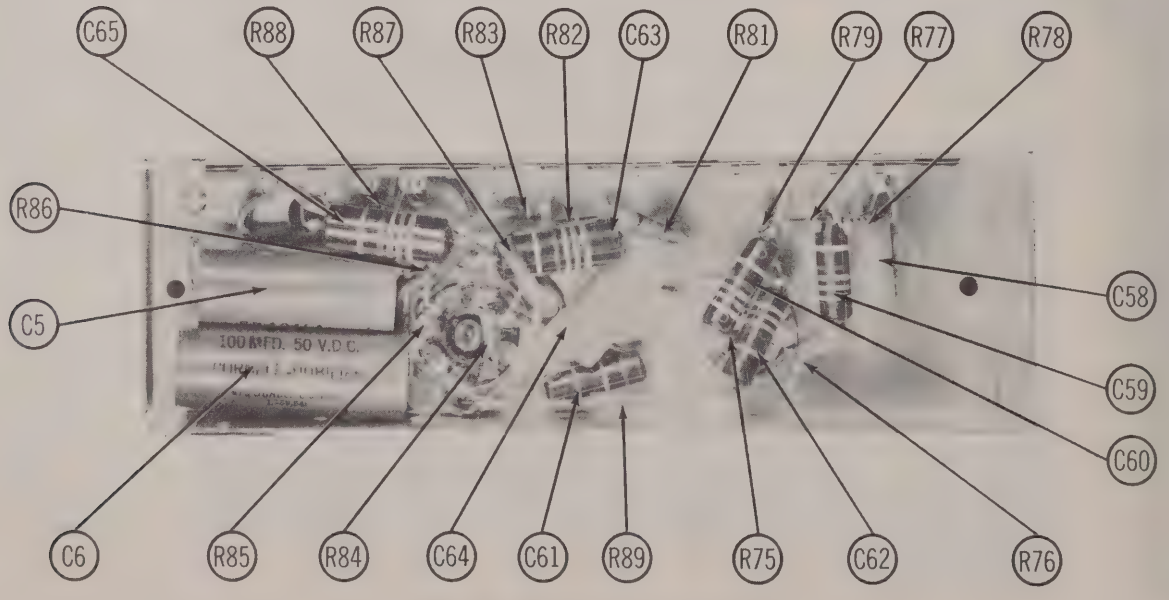
ITEM No.	TYPE	RATING	REPLACEMENT DATA: Setchell-Carlson PART No. FUSE	Setchell-Carlson PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3A 250V			312003	342001	AGC 3	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: Setchell-Carlson PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M2	1N60		1N60	1N60	Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	Setchell-Carlson PART No.	NOTES
M3	Dial Light		#47 Channel Indicator
M4	Tuner		"A" unit, Series # 3
M5	Switch	TV-147	Function
M6	Focus Magnet		Includes centering device
M7	Ion Trap		
M8	Dial Light		
M9	Tuning Cap.	TV1-25A	Radio (43-433MMF, 29-185MMF)



SUB CHASSIS E5

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light, check fuse (M1), switch on volume control and T1. If filaments light, substitute V27 and V26. Check B+ filter and decoupling network components.

SMALL AND/OR DIM PICTURE

Check by substitution V27 and V26. Check B+ filter and decoupling components for failure or change of value.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T2, T4A, R111, C83 and other associated circuit components.	Check C77, R103, R102, C75, C74, R99, R100 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22, V27 and V28. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V19, V20, V21 and V22. Check R106, R107, C78, C83, R111, T2, T4A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PICTURE

Check by substitution V1, V2, V3, V4, V5 and V6. Check tuner and video IF components. Check video detector crystal and associated components.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

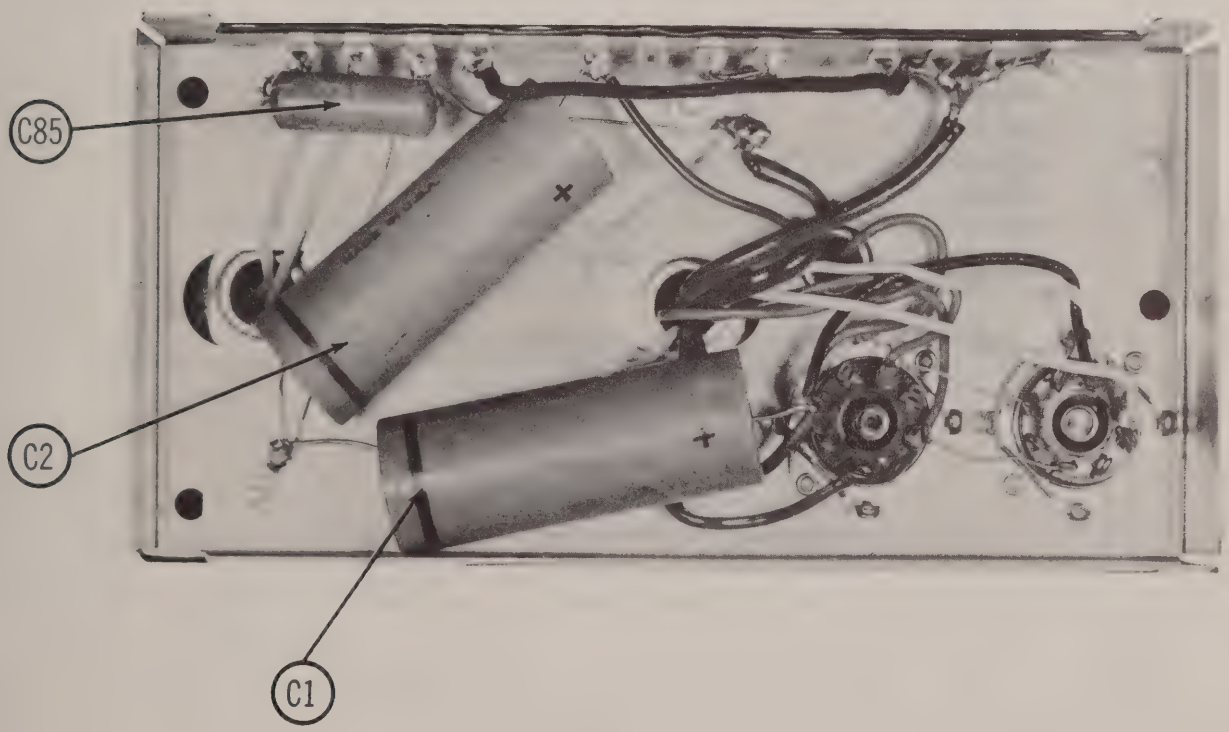
Check T4, C84, R115, R113 and R114.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

NOTE: Make sure all units are securely and properly connected.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



SUB CHASSIS G3

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at time, thru the small hole in the cabinet to the right of the channel selector shaft.

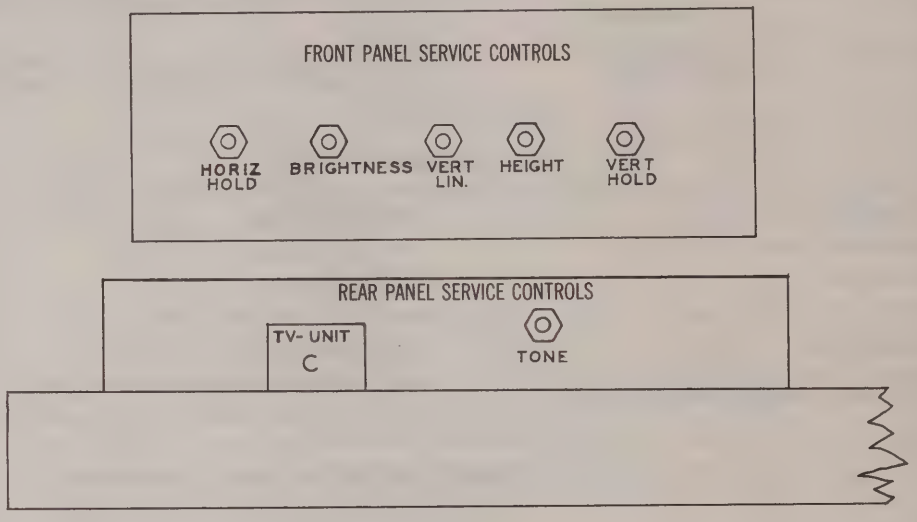
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjust the horizontal hold control to synchronize the picture horizontally.

If the horizontal hold control will not synchronize the picture, replace the horizontal mult. tube (V19).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L20) located on top of chassis. (See tube placement chart).

FUSES

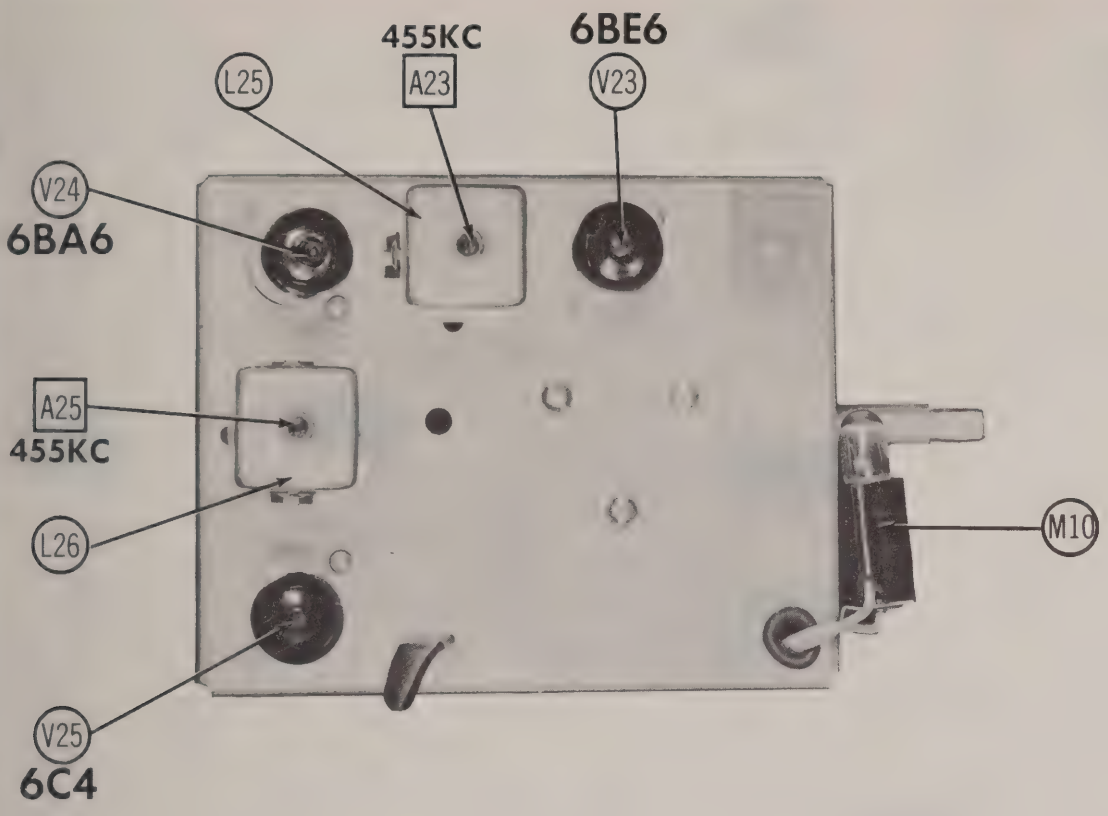
One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

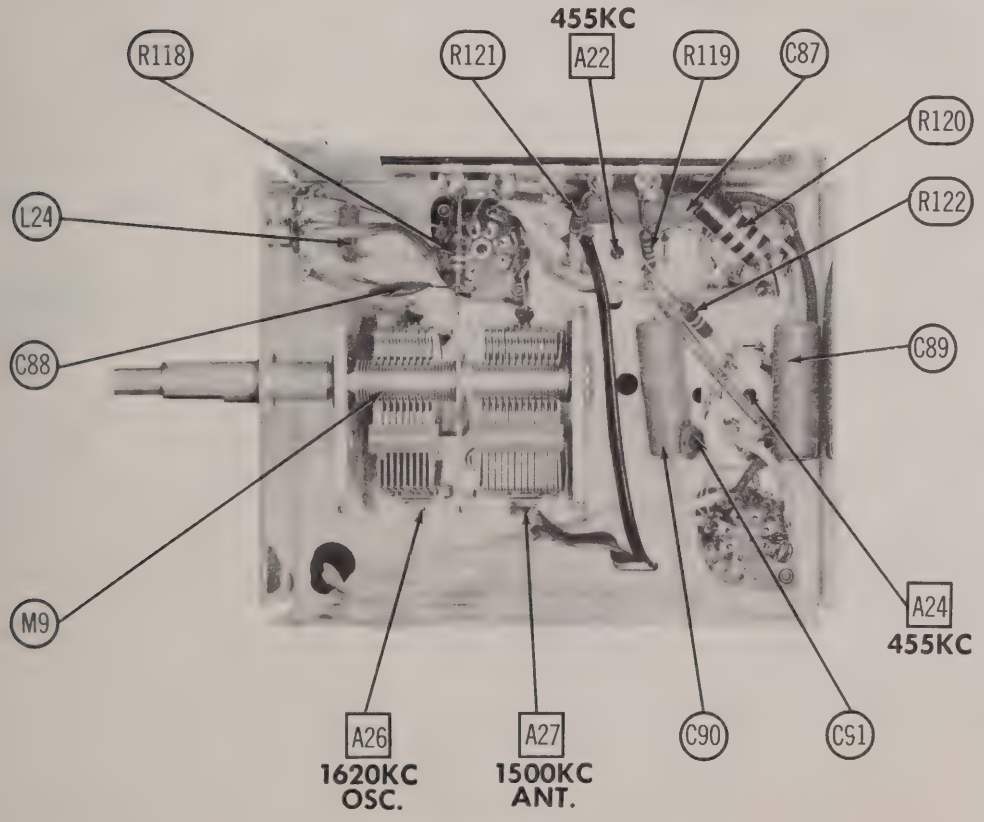
Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push-on type control knobs from front panel.
2. Remove 6 wood screws. Remove rear cover.
3. Disconnect speaker plug, CRT socket, yoke plug and HV plug.
4. Remove 2 wood screws. Remove transmission line from cabinet.
5. Remove 2 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.



SUB-CHASSIS H3



SUB-CHASSIS H3

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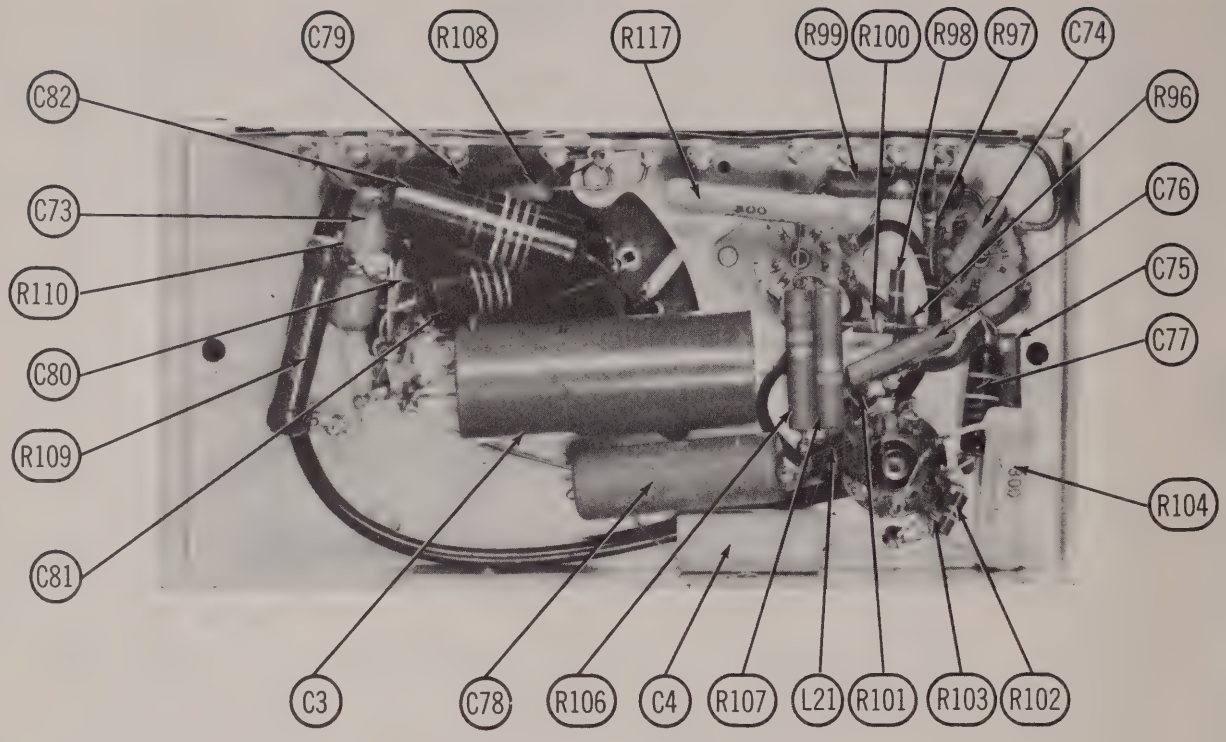

SUB-CHASSIS F7

PROPERTY OF
L. F. BLAN[illegible]
3924 ME[illegible]
DENVER, COLO[illegible]

SILVERTONE
MODEL 488.218

SILVERTONE
MODEL 488.218

Figure 1

SPECIFICATIONS

The 488.218 Tri-o-matic Record Changer Intermix Model is designed to play standard 78RPM, fine groove 45RPM, or long play 33 1/3RPM records of standard commercial dimensions. Records up to 12" in diameter can be played.

Features of this changer include playing and automatically changing as many as ten-12", twelve-10", or any assortment of 10" and 12" records of the same type (33 1/3 or 78RPM).

A full stack of twelve-7", 33 1/3RPM records or a full stack of twelve-7", 45RPM records (with the use of an adaptor) will also play on this changer.

The changer shuts off after the last record has been played.

Connect this changer only to an outlet supplying 117 volts, 60 cycle AC unless otherwise specified. Power consumption is 25 watts.

Supplied by:

Sears, Roebuck & Co.
925 S. Homan Street
Chicago 7, Illinois

Parts should be ordered from the nearest Sears, Roebuck & Co.
Retail Store or Mail Order Branch

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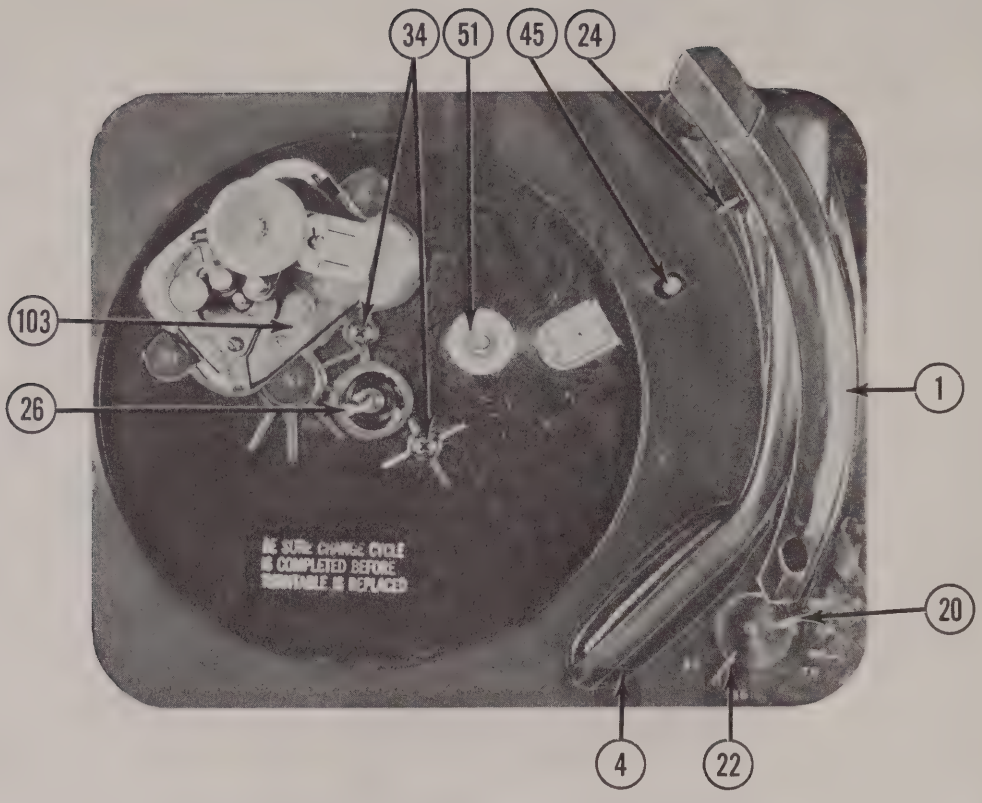


Figure 2

OPERATING INSTRUCTIONS

Loading-

1. Pull straight up on record support knob until record support clears spindle. Swing record support to the right until pin in shaft drops into locating groove.

2. This changer will automatically play ten-12" either standard or long-play records, twelve-10", either standard or long-play records, any assortment of ten-12" and 10" records intermixed, or twelve-7" long-play or fine-groove records.

NOTE: Standard, fine-groove, and long-play records cannot be intermixed. The motor speed control knob must be reset for each type or recording.

3. Place records on spindle and lower to offset shelf. Hold records level and replace record support over spindle.

To Play Standard Recordings-

1. Motor speed control knob must be in the "78" position.

2. To start, turn changer control knob to "Rej." and release. The changer will operate automatically until the last record has been played, at which time, pickup arm returns to rest and the changer control knob to the "Off" position. Changer automatically stops.

To Play Long-Play (33 1/3RPM) Records-

1. Motor speed control knob must be in the "33" position.

To Play Fine-Groove (45RPM) Records-

1. Motor speed control knob must be in the "45" position.

2. Most of these records are manufactured with a 1 1/2" spindle hole. It is essential that a record adaptor be used with all large hole records.

Rejecting-

To reject a record at any time while changer is operating, turn changer control knob to "Rej." and release.

Stopping-

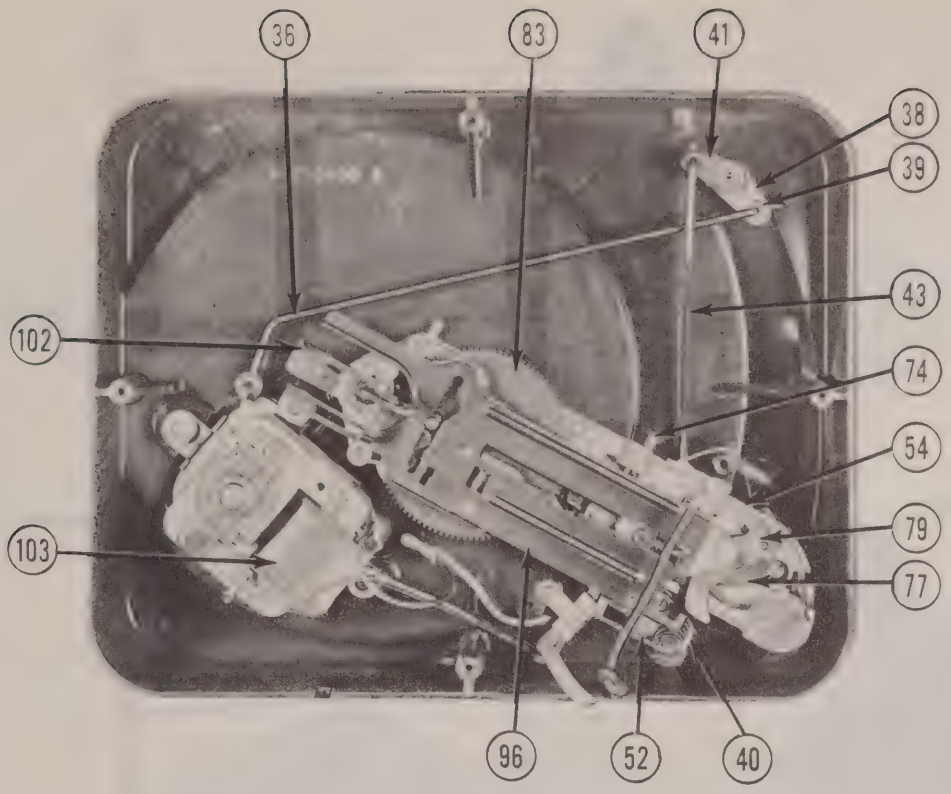
To turn off changer before automatic shut-off, turn changer control knob to "Off". Lift pickup arm and place on rest.

Unloading-

Lift the record support and swing to the right until pin in shaft drops into locating groove. Lift stack of records straight up and off spindle.

Manual Operation-

To play single records or home recordings, allow the changer to go through its complete shut-off cycle. Lift the record support arm and move it to the right until clear of the turntable. Place record on spindle and lower to spindle shelf. Tilt record down toward left front of changer base and lower record to turntable. Turn Changer Control Knob To "On" Position Only. Raise pickup arm and place in lead-in groove of record.



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DENVER, COLORADO

Figure 3

Repeating Of 7", 10" Or 12" Records-

To repeat records, swing record support clear of spindle, place record on the turntable, and start changer. Record repeats until control is turned "Off". If a 12" record is repeated, wait for the changer to finish cycling and reposition the pickup arm manually to the 12" position.

Suggestions-

When loading and unloading the changer, use care to prevent bending the spindle. Records should not be left on the spindle except during operation of changer. Records will warp. When machine is not in use, it is suggested that the speed control knob be left in the neutral position. This position is identified by the letter "N" engraved on the changer base. For best reproduction, keep needle and records clean. Store records flat, in folders or in albums. Do not lay record on record.

CHANGE CYCLE

It is recommended that the change cycle operation be observed by rotating the turntable by hand. The action described below can then be readily followed and the function of each part more easily understood.

This changer is provided with what is known as a velocity trip mechanism. The change cycle is started by the faster inward motion of the pickup arm when the needle enters the trip grooves at the end of the record. Only records having fast finishing grooves before the eccentric cycling groove will operate this velocity trip.

The pickup arm and hinge assembly and trip finger cam and shaft assembly (79) are secured at opposite ends so that they move in unison. As the pickup arm nears the end of a record, the trip finger cam (79) pushes the trip link (90), which, in turn, engages the trip lever (88) rotating the pawl lever (86) to move the trip pawl toward the hub on the turntable. While a record is playing, the small motions of the trip pawl are not sufficient to cycle the mechanism because on each revolution of the turntable the wiping contact by the hub projection moves the trip pawl back to clear the projection.

During the first revolution of the turntable in which the pickup arm advances rapidly, the trip pawl is moved far enough to definitely engage the projection on the turntable hub. The gear on the turntable hub will now engage the main gear (83) and start its rotation. This in turn, starts the lateral motion of the slide and cam assembly (96). The slide and cam assembly (96) moves to the rear through the action of an eccentric pin on the main gear (83) moving in the cross slot on the slide and cam assembly (96).

As the slide and cam assembly begins to move, the cam surface at the rear pushes the lift pin (16) upward, raising the pickup arm clear of the record. At the same time, the tab on the rear of the slide and cam assembly (96) contacts the trip finger cam (79) swinging the pickup arm clear of the turntable.

The front edge of the ejector link slot in the slide and cam assembly (96) then contacts the ejector link on the ejector link assembly (102). The ejector link moves the pusher shaft and housing assembly (33) upward, actuating the spindle assembly (26), causing the record pusher (29) to move straight up so as to enter the center hole of the record, and then to be pivoted forward, dropping a record to the turntable. (See Figure 5.)

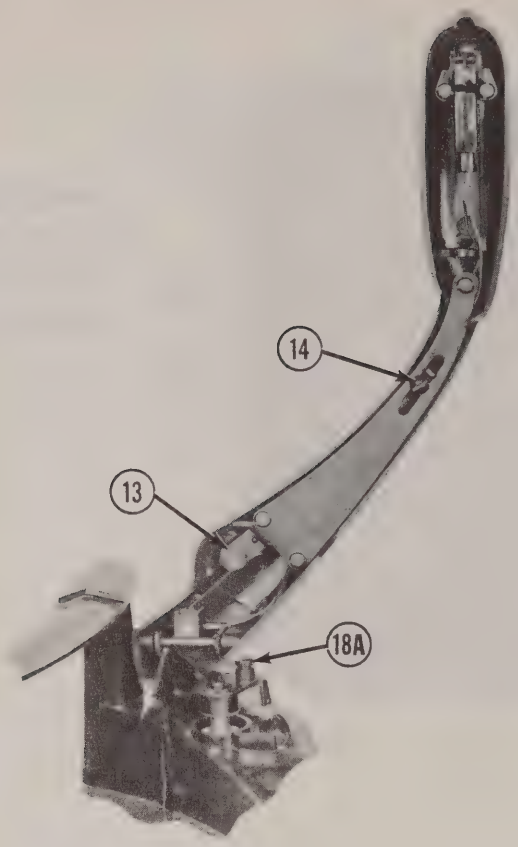

Figure 4

Simultaneously, the tab on the rear of the slide and cam assembly (96) contacts the pickup arm return locator (77), moving it clear of the reset lever (70). The pickup arm return locator (77) is now locked in position with the trip finger cam (79) by means of matching holes in the pickup arm return locator (77) and detents in the trip finger cam (79). This is accomplished by the pressure of the compressed conical lift pin spring (81) overcoming the pressure of the lift pin compression spring washer (80).

At the same time, the cam surface of the bracket on the main gear assembly (83) moves the reset lever (70) to mid-position (10" set-down) where it is held by the 12" record selector (24). The slide and cam assembly (96) continues to the rear and then starts forward. If 7" records are being changed, the rubber bumper (45) of the 7" set-down lever (66) is free to move upward permitting the other end to drop into the hole in the main gear (83) as this gear rotates. This action of the 7" set-down lever (66) raises the reset lever (70) to the upper position (7" set-down).

If 10" records are being changed, the 7" set-down lever (66) will not operate as the rubber bumper (45) will contact the edge of the record and the reset lever (70) will remain in the mid position (10" set-down) as originally placed by the caming action of the bracket on the main gear (83).

If a 12" record is being changed, the edge of the record strikes the 12" record selector (24) releasing the reset lever (70) which drops to the bottom position (12" set-down).

As the slide and cam assembly (96) continues forward, the tab on the rear of the slide will move

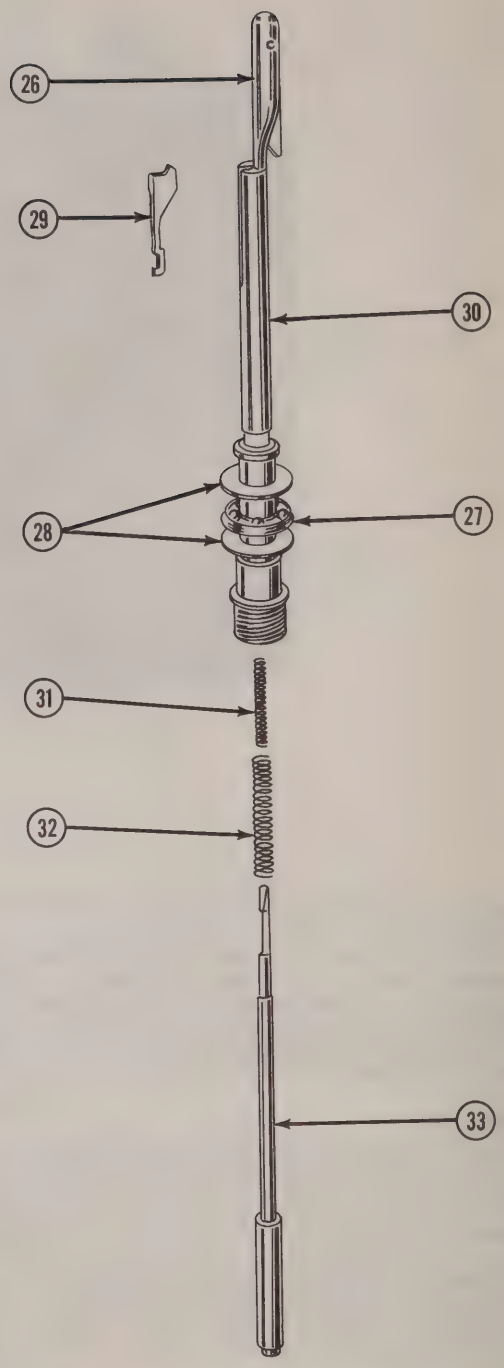

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Figure 5

clear of the pickup arm return locator (77) and trip finger cam (79), which are still locked together. These rotate under the action of the pickup arm return spring (58) until one of the three set-down steps in the pickup arm return locator (77) strikes the reset lever (70), which has been positioned by the record being changed (see above). This stops the inward movement of the pickup arm return locator (77), trip finger cam (79) and pickup arm. The pickup arm is then lowered to the lead-in groove of the record as the lift pin (16) rides down the rear cam surface of the slide and cam

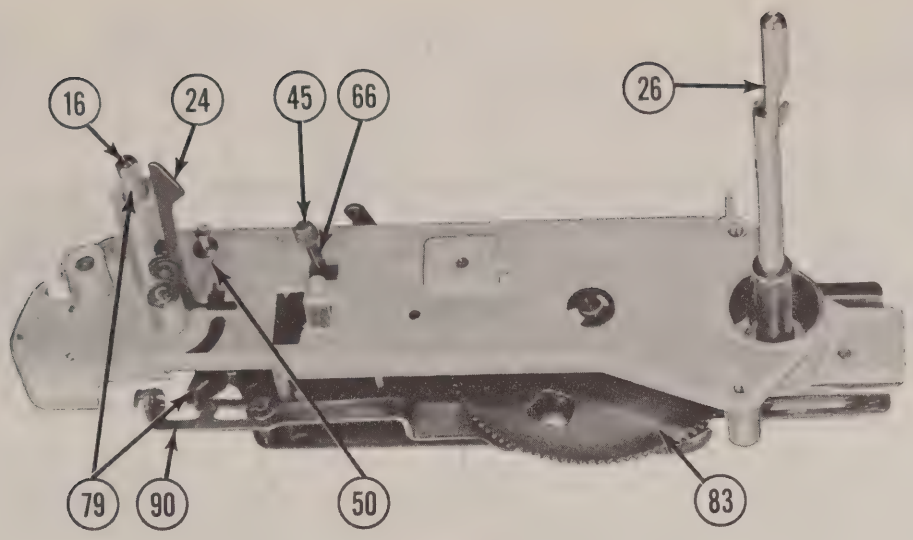

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Figure 6

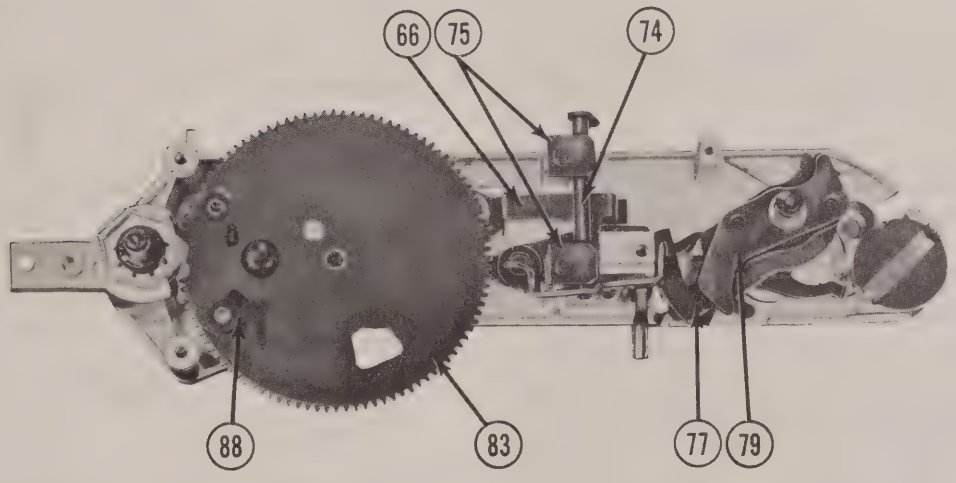

Figure 7

assembly (96). As the pressure is released by the conical lift pin spring (81), the lift pin compression spring washer (80) separates the pickup arm return locator (77) and trip finger cam (79), permitting the pickup arm to ride freely across the record.

As soon as the last record has been dropped, the record support assembly (1) drops below the shelf on the spindle assembly (26) and the lower end of the support post contacts the arm of the shut-off lever on the shut-off lever bracket assembly (52). This, in turn, rotates the lever assembly (74) so as to force the lever assembly (74) against the escape lever (97) on the slide and cam assembly (96). At the end of the change cycle, which drops the last record, the end of the lever assembly (74) drops into the main slot on the slide and cam assembly (96), and the other end of the lever assembly (74) is pushed against the pickup arm return locator (77).

When the last record has been played, the change cycle starts again; however, this time, as the pickup arm return locator (77) is pivoted clear of the reset lever (70) by the tab on the slide and cam assembly (96), the lever assembly (74) rises to the shut-off position. A tab on the lever assembly (74) raises the trip link (90) to the upper position. As the pickup arm return locator (77) starts to return the pickup arm to the record, it is stopped by the lever assembly (74) with the pickup arm positioned over the pickup arm rest. The main gear continues to rotate pulling the trip link (90) forward to reset it. A tab on the upper surface of the trip link (90) contacts a lever on the control shaft assembly (63) and rotates the control shaft assembly to turn off the motor and return the control knob to the "Off" position.

As the slide and cam assembly (96) moves forward, the lift pin (16) rides down the rear cam surface lowering the pickup arm to the pickup arm rest.

TRIPPING & AUTOMATIC SHUT-OFF OPERATION

In the following paragraphs a complete explanation of the mechanical operation pertaining to the "Tripping" and "Automatic Shut-Off" operations are given as these phases of the change cycle are likely to be the most difficult to understand.

Tripping- (Refer to Figure 9)-

While a record is playing, the small motions of the trip pawl are not sufficient to cycle the mechanism because on each revolution of the turntable the wiping

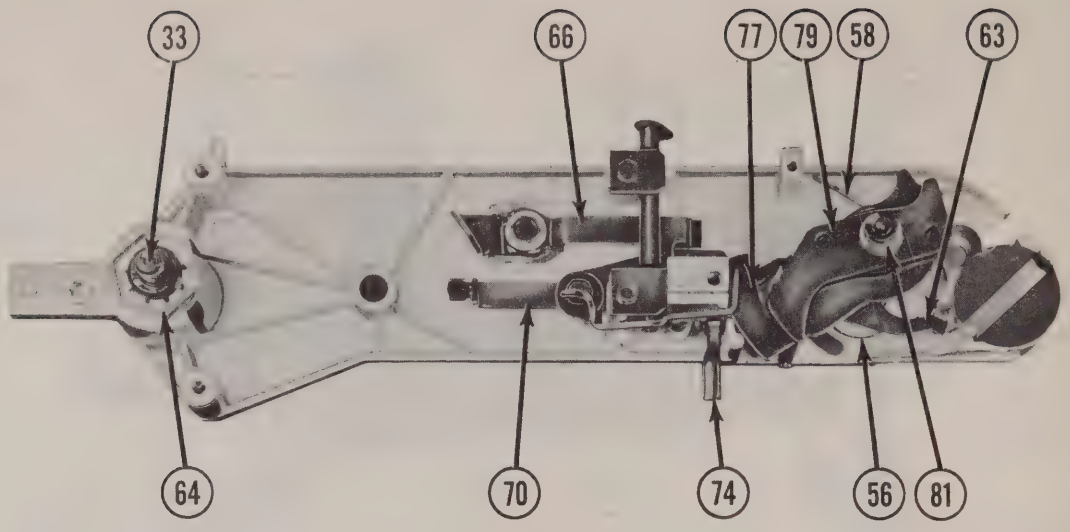

Figure 8

contact by the hub projection moves the trip pawl back to clear the projection. This slight movement of the pawl continues as long as the pickup arm moves in at a constant rate of speed. When the needle leaves the recorded section of the record, the rapid acceleration results in rapid movement of the trip pawl. The trip pawl assumes a position in which the projection on the turntable hub makes a positive contact and the main gear (83) is pushed sufficiently for engagement with the teeth on the turntable hub. This starts the change cycle.

Mechanism Stops After Playing
Of Last Record- (Refer to Figure 10)-

1. As the last record of the stack drops to the turntable the record support assembly (1) drops and actuates the stop arm on the shut-off bracket assembly (52). This stop arm in turn applies force to the shut-off lever assembly (74). At this moment the slide and cam assembly (96) is in the outermost position (away from spindle) and the end of shut-off lever assembly (74) is forced against escape lever (97) which prevents it from lowering any further.

2. As the slide and cam assembly (96) returns to the out of cycle position the end of shut-off lever assembly (74) slides off the escape lever (97) permitting the end to extend down through the slot in the slide and cam assembly (96). At this time the pickup arm return plate (77) has rotated too far to be blocked by the other end of the shut-off lever (74) and the pickup arm is permitted to land on the record.

3. After the last record has been played the mechanism again goes into change cycle, and the slide and cam assembly (96) moves to its outermost position. At this moment the force which has been applied to the shut-off lever assembly (74) from the record support causes the end to lower, thus extending further through the slide and cam assembly (96). The other end of the shut-off lever (74) raises and blocks the pickup arm return locator (77) which at this moment is held back by the slide and cam assembly (96).

4. As the slide and cam assembly (96) moves back toward the spindle, it carries the raised trip link (90) along until finally the formed end of the trip link pushes control shaft (63) which in turn actuates power switch (57). This removes power from the drive motor and the mechanism stops.

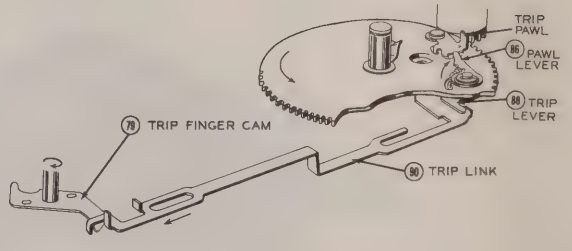

Figure 9

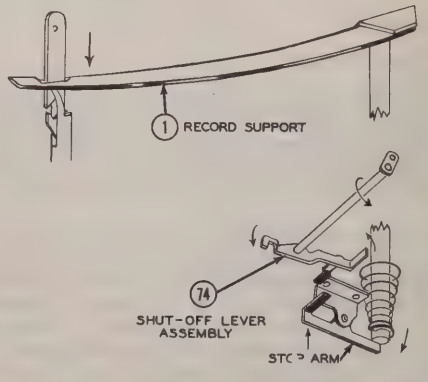

Figure 10

5. The lift pin (16) rides down the incline on the rear of slide assembly (96) and lowers the pickup arm to the arm rest.

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use or high-operating temperature, the changer should be lubricated as follows: (Refer to the exploded view).

Apply Andok "B" or Texaco Sta-Put to:

1. Edges of all slots in slide and cam assembly (96).

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2. Outer edges of tines on forked end of slide and cam assembly (96).

3. Lift pin cam surface on slide and cam assembly (96).

4. Lower surface of pickup arm return locator (77).

5. Inner surface of tab on rear of slide and cam assembly (96).

Apply a small quantity of light mineral oil to:

1. Trip finger cam shaft (79).

ADJUSTMENTS

Needle Set-Down (Refer To Figure 4)-

The set-down position of the needle is adjusted by means of the set-down adjustment screw (18A) mounted on the hinge arm assembly (18). Turn this screw adjusting pickup arm for correct set-down on a 10" record. When the correct set-down is obtained for the 10" position, the 12" and 7" needle set-down will also be correct.

Pickup Arm Height (Refer To Figure 4)-

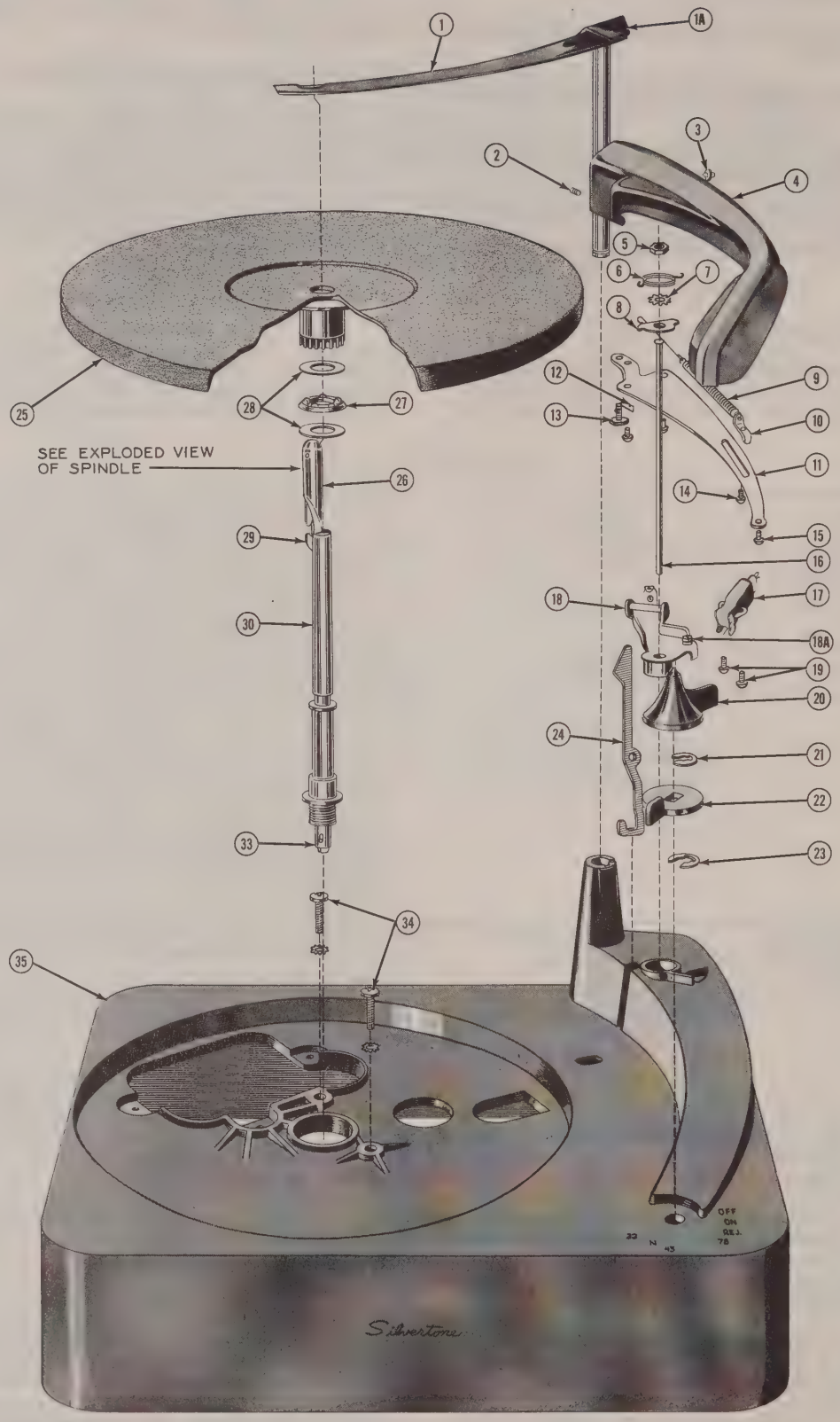
The pickup arm height is adjusted by the lift screw (13) located at the rear of the strengthener. To raise the height of the pickup arm, turn this screw counterclockwise. To lower the arm, turn clockwise. The pickup arm height should be adjusted so that with a 1 1/8" stack of records on the turntable the pickup arm lifts 1/4" straight up as the change cycle starts.

Needle Pressure (Refer To Figure 4)-

The needle pressure should be between 10 and 12 grams. Adjustment may be made by loosening screw (14) on the slide which moves in a slot in the pickup arm strengthener. Move the slide back or forward until the correct needle pressure is obtained.

TROUBLE CHART

SYMPTOM	CAUSE	REMEDY
Turntable does not revolve when control is turned to "On".	1. No current at motor.	(a) Check that current is reaching AC leads of changer. (b) Check that switch is closing. (c) Check wiring and soldered terminals in the changer.
	2. Motor defective.	(a) Remove turntable to allow motor to operate without load. If current is reaching motor and drive spindle does not rotate, the motor is defective. Repair or replace.
	3. Motor idler wheel not engaging turntable rim.	If drive spindle is turning but turntable is not: (a) Check motor idler assembly to determine if it is free to contact the drive spindle and turntable rim. (b) Wipe off inside rim of the turntable (25) to remove flock, or if oily, clean the turntable rim and rubber tire of the idler wheel with naphtha, or alcohol.
Changer does not cycle when the control knob is turned to "Reject".	1. The manual reject not actuating the trip.	(a) Turn the control knob (20) to the reject position, hold and see that the control shaft assembly (63) has moved the trip link (90) to the rear. This should actuate the trip pawl on the main gear (83), which will bring the spur on the trip pawl in contact with the hub gear on the turntable hub. (b) Check for binding of the pawl lever (86), the trip lever assembly (88) and the trip pawl. If binding occurs, clean out all foreign matter and check for freedom.
Control knob cannot be turned to "On" position.	1. Machine shut off during cycle.	Turn the turntable clockwise, by hand, until the control knob (20) is free.
Pickup arm strikes records on spindle when it raises, or pickup arm rest when it moves out.	1. Pickup arm height not adjusted properly.	See instructions for adjusting pickup arm height under "Adjustments".
Turntable speed too slow (refer to exploded view).	1. Binding in turntable bearing.	Check the turntable bearing for freedom. Hold the motor idler wheel out of engagement with the turntable and spin the turntable, by hand, to see if it turns readily and coasts for a long time. If binding occurs, remove turntable, clean off foreign matter, and lubricate with light mineral oil.
	2. Line voltage too low.	The line voltage should not be less than 105 volts or the turntable may be too slow.



A PHOTOFACT "EXPLODED" VIEW

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Figure 11A. Exploded View Of Parts Above Baseplate.

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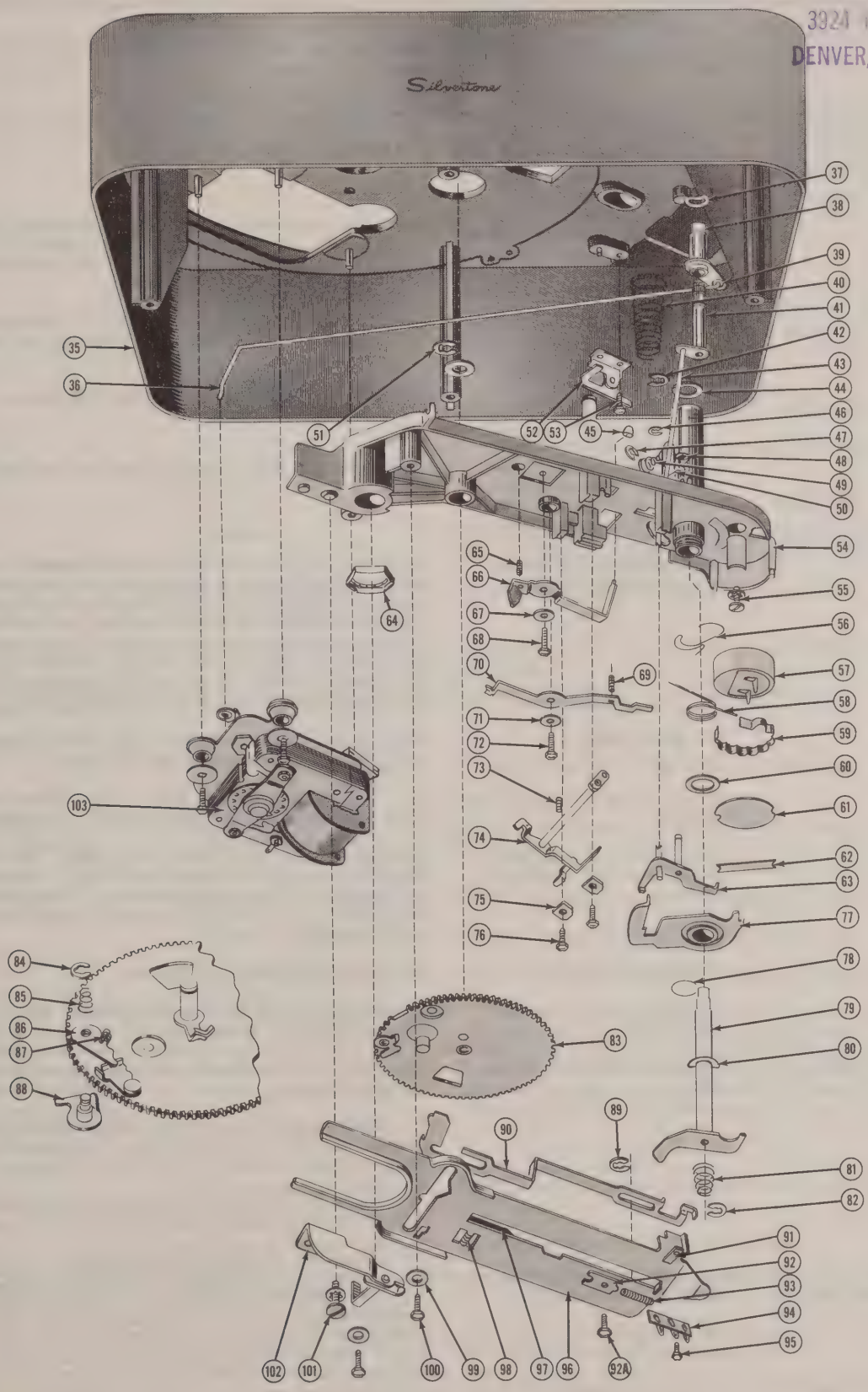

Figure 11B. Exploded View Of Parts Below Baseplate.

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SYMPTOM	CAUSE	REMEDY
	3. Operating temperature too low.	If the machine has been stored in a cold place or operated in surroundings at a temperature of less than 60° F., the turntable speed may be too slow.
Turntable stalls or slows down during cycle (refer to exploded view).	1. Motor idler not engaging turntable.	See "Turntable Does Not Revolve When Control Knob Is Turned To "On" Position".
	2. Binding in drive mechanism.	Hold idler away from turntable, or remove idler wheel. Cycle machine by turning turntable slowly by hand. The main gear should turn freely for the complete revolution without binding at any point. (a) If binding occurs, check for foreign matter in the gear teeth, a bent gear bearing, or bent spindle bushing. Straighten or replace. Clean and lubricate.
	3. Binding between pick-up arm lift pin (16) and lift pin cam surface on slide and cam assembly.	Lift pin should ride freely on cam surface without binding.
	4. Spindle pusher spring compressing too far.	Cycle the changer and watch the relationship between the bottom of the pusher housing and the lower button of the pusher housing. Just before the slide and cam (96) has completed its backward motion, the pusher housing should stop its upward motion and the lower button should continue up .005 to .047" more, slightly compressing the pusher spring. If the spring compresses to much, the changer may stall on the shut-off cycle.
	5. Motor weak.	When everything checks all right, but the changer still stalls in cycle, the motor may be weak.
	6. Grease on idler wheel.	1. Wipe off idler wheel rubber tire; inner rim of turn table and rubber belts with naphtha or alcohol.
	7. Turrets unseated from lock ring on turret shaft.	Remove turret and center lock ring. (If lock ring is distorted, replace with new lock ring.) Replace turret and press down to assure turret of being locked to the turret shaft. (Turret will snap into position when properly locked.)
	8. Idler slide bent.	Straighten and clean or replace.
	9. Idler wheel tension spring weak.	Replace spring or bend motor tension spring anchor bracket to give desired tension.
Changer continues to cycle.	Reject Mechanism binding.	(a) Make certain the trip link (90) is not frozen in the reject position. (b) Make certain the changer control lever (63) is not binding and that it actuates the trip link (90) when the changer control knob (20) is turned to reject. (c) Check for binding of trip pawl, trip lever (88) and pawl lever (86); these must be free to turn easily. (d) Check the changer control linkage, (43) and (63).
Noise during playing of record.	1. Motor rumble.	If a low-pitched rumbling sound comes from the loud speaker while a record is being played, check motor grommets to be sure the motor is freely suspended on them. The motor lead wires should have slack to allow the motor to float. Motor rumble may also come from an unbalanced motor rotor; in this case, replace the motor.
	2. Defective turntable bearings (27).	Defective turntable bearings can cause rumble. Check for foreign matter in the bearing, defective balls, bind-

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SYMPTOM	CAUSE	REMEDY
		ing between balls and ball retainer; rough surface on washers. Clean ball bearing, sleeve bearing, and washers; lubricate with light mineral oil.
	3. Defective motor idler wheel or speed pulleys.	A rapid thumping sound while the motor is running may indicate a flat spot on the motor idler wheel or speed pulleys. If this condition does not clear up after ten minutes of running time, remove the turntable and check the rubber tire on the idler or pulleys. If the surface of the rubber tire is not smooth and even, replace the part. Should the bearing of the idler wheel show signs of excessive wear or be extremely wobbly, the idler wheel should be replaced.
	4. Defective record.	Worn or defective records cause needle scratch and distortion of the recorded sound. If the record is warped, it may slip on the other records causing "Wow" (a waver in the recorded sound). An enlarged hole in the record can also cause "Wow".
	5. Turntable scrapes.	If a scraping sound occurs as the turntable revolves, check: (a) Turntable warped, causing outer rim to rise and fall. (b) Motor idler or mounting plate bent.
	6. Squeaks.	Squeaking sound as changer operates indicates lack of oil. Lubricate points indicated under "Lubrication".
	7. Pulleys on motor not properly seated.	Check that pulleys are properly seated.
	8. 7" lever (66) loose.	Check 7" lever washer (67) and screw (68) to see if they are tight.
Distortion of Recorded Sound.	1. Defective record.	See "Noise During Playing Of Record".
	2. Defective amplifier.	Check phonograph amplifier and speaker.
	3. Bad cartridge.	Replace.
No Sound During Playing.	1. Defective cartridge.	Replace.
	2. Defective wiring.	Check pickup leads for a shorted or open lead.
	3. Defective amplifier.	Check phonograph amplifier and speaker.
	4. Loose cartridge terminal clips.	Remove, squeeze together slightly, and replace.
Excessive Record Wear.	1. Binding of pickup arm.	See "Needle Does Not Track Across Record Properly".
Changer does not shut off after last record has been played (refer to exploded view).	1. Record support binding (1).	The record support must drop below the off-set shoulder of the spindle or the changer will not shut off.
	2. Lever assembly binding (74).	Clean out dirt and make sure this operates smoothly.
	3. Shut-off lever (52) binding.	Check lever and if bent, straighten.
Rough pickup arm motion.	1. Horizontal defects.	(a) Check pickup arm return locator (77) for tightness. (b) Check that pickup arm return spring (58) is not weak and is hooked up properly. (c) Check that fiber washer (60) is installed under pickup arm return locator.
	2. Vertical defects.	(a) Lift pin (16) binding; clean out dirt and lubricate.

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SYMPTOM	CAUSE	REMEDY
		(b) Slide and cam (96) binds; check bearing points -- clean and lubricate.
		(c) Burrs in main slot in slide and cam (96) -- remove with fine file.
		(d) Ejector lever on ejector bracket assembly (102) binding in slide and cam slot; straighten, remove burrs, and lubricate.
		(e) Pickup arm shaft and sleeve binding; clean and lubricate.
Noise during change cycle.	1. Tines on the forked end of the slide and cam assembly (96) bent.	Replace.
	2. Lack of lubrication, grinding noise.	Lubricate ejector lever (102) where it contacts lower end of spindle (33).
Control knob does not detent on "33", "45", or "78" positions.	1. Bent parts.	(a) Insure that forked shaped stamping under idler is catching in detent notch. Straighten or replace motor.
		(b) Insure that speed control arm (38) and speed control rod (36) are not bent.
Cartridge drags on record.	1. Needle bent.	Replace needle.
	2. Cartridge mounting screws loose.	Tighten.
Shuts off when last record drops.	1. Shut-off bracket (52) bent.	Straighten or replace.
	2. Record support bent.	Bend down slightly so record support (1) is parallel with the base plate.
	3. Loose bearing (75) on shut-off lever assembly (74).	Tighten.
Will not play manually.	1. Trip link (90) bent.	Straighten or replace.
	2. Trip finger cam (79) bent.	Straighten or replace.
Impossible to adjust set-down.	1. Pickup arm shaft and sleeve assembly (79) defective.	Shift the safety plate (8) toward the eccentric set-down adjusting screw (18A), and tighten pickup arm shaft and sleeve nut (5). Hold pickup arm against rear stop and push on trip finger cam (79). The safety plate (8) should move away from the set-down adjusting screw (18A) and snap back when the trip finger cam (79) is released; if it does not, replace the pickup arm shaft and sleeve assembly (79). Hinge pivot screws may be adjusted favoring one side or the other.
Record does not drop when changer cycles.	1. Spindle pusher shaft and housing assembly (33) broken.	If the pusher shaft (inside the spindle) is broken, the lower end (housing) will drop out of the spindle (30) (see Figure 5). Loosen spindle nut (64) and remove spindle (26). Replace with new spindle unit.
	2. Record pusher (29) in spindle not moving far enough forward to reject a record.	The record pusher should move up inside the spindle body (30), then move forward until it has reached a point flush with, or a maximum of, .010" beyond the spindle body (30).
		To insure that the record pusher (29) is all the way forward, the lower button on the shaft and housing assembly (33) should be raised high enough by the ejector lever to slightly compress the pusher spring inside the pusher shaft and housing assembly (33). (See "Turntable Stalls During Cycle".) If the spring is compressed and the re-

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SYMPTOM	CAUSE	REMEDY
		cord pusher (29) does not move far enough forward to eject a record, the spindle (26) should be replaced. If a record is not pushed completely off the ledge, it may hang on the spindle momentarily, then drop on the pick-up arm when it moves in over the turntable.
	3. Record pusher (29) raises outside the spindle body (30).	When changer cycles, the record pusher (29) should rise up just inside the spindle body, then move forward inside the center hole in the record. If the record pusher (29) rises outside the spindle body (30), it will raise the record instead of pushing it off the spindle ledge. Remove the spindle (26) and replace with a complete new spindle assembly.
Two records drop at once (refer to exploded view and Figure 5).	1. Hole in record too large.	Check the diameter of the hole in the record. An oversize hole will cause two records to drop at once.
	2. Spindle guide not fully down.	If the spindle guide is not all the way down, more than one record may be dropped at a time. (a) Check the guide to be sure it is free and does not bind at any point. Clean out foreign matter or straighten if necessary. Do not oil. (b) When records are placed on the spindle, be sure the guide is all the way down. The guide will normally raise as a record is being dropped, but it should return to place immediately, by gravity.
	3. Record pusher (29) defective.	The record pusher (29) may be deformed, etc. This may cause two records to drop at once. Replace with new pusher or replace spindle assembly.
	4. Slight play in spindle (26).	Tighten spindle nut (64). If stripped, replace.
Record hits pickup arm (refer to exploded view).	1. Record pusher (29) not moving far enough forward to eject record.	See "Record Does Not Drop When Changer Cycles" #2.
	2. Record pusher (29) extending beyond outside diameter of spindle.	Cycle changer, by hand, until pusher shaft and housing assembly (33) is at the top of its travel. Using new record as a gauge, pass it over the spindle to see if it binds at any point. File off high points on record pusher (29), with a fine file, until record will pass freely over spindle.
	3. Pickup arm not adjusted properly.	See "Adjustments".
Needle does not set down on 10" record in proper position (refer to exploded view).	1. Pickup arm not adjusted properly.	See "Adjustments". (a) Loose nut (5) on pickup arm shaft and sleeve (79).
	2. Pickup arm shaft and sleeve (79) binding.	File off burrs and rough surfaces. Polish and lubricate shaft.
	3. 7" set-down lever (66) and 12" record selector (24) not operating properly.	Insure that the proper operation and reset of the 7" set-down lever (66) and 12" record selector (24) is not being interfered with.
	4. Needle bent.	Replace with new needle.
	5. Wire spring (50) broken.	12" record selector (24) does not cock; check for broken 12" record selector spring (50).
	6. Bent pickup arm return locator (77).	Straighten or replace.
	7. Bent trip finger cam (79).	Straighten or replace.

TROUBLE CHART - Con't.

SYMPTOM	CAUSE	REMEDY
Needle does not set down on 12" record in proper position (refer to exploded view).	1. Diameter of 12" record undersize.	The set-down position of the needle for 12" records is determined by the edge of the record striking the 12" record selector (24). If a 12" record has a diameter of less than the standard size of 11-7/8" plus or minus 1/32", it may fail to depress the 12" record selector far enough.
	2. Enlarged center hole in record.	An enlarged center hole might fail to set the 12" record selector because it could produce the same effect as a small record.
	3. Pickup arm not adjusted properly.	See "Adjustments".
	4. Binding of pickup arm shaft and sleeve (79).	Clean and polish shaft (79), and lubricate with light oil.
	5. Reset lever spring (69) broken.	Replace spring (69).
	6. 12" record selector spring (50) broken.	Replace spring (50).
	7. 12" record selector (24) binding.	The 12" record selector must be free to operate smoothly. Clean out dirt and straighten if bent, or replace.
	8. Bent pickup arm return locator (77).	Straighten or replace.
	9. Bent trip finger cam (79).	Straighten or replace.
Needle does not set down on 7" record properly.	1. 7" set-down lever spring (60) broken or weak.	Replace.
	2. Pickup arm not adjusted properly.	See "Adjustments".
	3. 7" set-down lever screw (68) loose.	Tighten.
	4. 7" set-down lever (66) hitting frame or baseplate where it goes through hole in frame.	Straighten or replace.
	5. Reset lever (70) bent.	Replace.
	6. 7" set-down lever (66) does not fall into opening in main gear.	Replace.
	7. Bent pickup arm return locator (77).	Straighten or replace.
	8. Bent trip finger cam (79).	Straighten or replace.
Changer does not cycle when record has been played.	1. No finishing trip groove on record.	Check record for eccentric trip groove in center of record. Some old records and home recordings do not have this eccentric trip groove.
	2. Needle jumps out of grooves in record.	(a) Check trip pressure; the lateral pressure should not exceed 3 grams. If pressure is excessive, see "Changer Trips Before Needle Reaches End Of Record".
		(b) The record may be defective; the finishing groove is often too shallow. Check with a record that is known to be good.
		(c) The needle point may be damaged or affected by an excessive accumulation of dust, lint, etc.; check needle pressure as described under "Adjustments".

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SYMPTOM	CAUSE	REMEDY
		(d) There may be binding in the pickup arm shaft and sleeve assembly (79) or between the pickup arm return locator (77) and the trip finger cam (79); see "Needle Does Not Track Across Record".
	3. Trip pawl binding on gear face.	The trip pawl must be free to move forward and engage the boss on the turntable hub when the trip lever releases it. Check for burrs or foreign matter lodged between the trip pawl and main gear (83). Do not oil as this might collect dirt and gum up the pawl.
	4. Trip finger cam (79) bent.	Straighten or replace.
	5. Trip link (90) bent.	Straighten or replace.
Changer trips before needle reaches end of record.	1. Hole in record too large.	If the hole in the record is too large, the groove may turn eccentric with the spindle and cause premature tripping.
	2. Binding of trip link (90).	With the trip link released, check the trip link for freedom of motion. It should be free to move without binding.
Needle does not track across record properly.	1. Needle may be clog by accumulation of lint, dirt, etc., or worn.	(a) Clean foreign material from around needle. (b) Check needle to see if the tip is bent or broken. Replace, if necessary.
	2. Trip finger cam (79) does not disengage from the pickup arm return locator (77) when cycle is completed.	There should be a 1/32" gap between the trip finger cam (79) and the pickup arm return locator (77) when the machine is not in cycle. If the gap is small enough to allow the parts to touch and bind as the needle moves across the record, the compression spring washer (80) may be weak or broken. Replace.
	3. Check the bearing in the pickup arm post for binding.	(a) Check pickup arm return locator (77) and trip finger cam (79) for binding. (See 2 above.)
	4. Pickup leads too tight.	Give the pickup leads enough slack to allow the tone arm to move freely across a record.

PARTS LIST

Ref. No.	Part No.	Description
1	K5278-F	Record Support Assembly - Consists of:
1A		K2903-G Plastic Button
2	K4923	Hinge Pivot Screw
3	K4922	Hinge Button Bearing
4	K2542-B	Tone Arm
5	K3887	Jam Nut # 1/4-28
6	K4937	Safety Spring
7	K3888	Lockwasher
8	K4339	Safety Plate
9	K4198	Hinge Spring
10	K2934	Adjusting Slide
11	K2543	Strengthener
12	K2255	Lock Spring
13	K2912	Lift Screw
14	K2449	Slide Screw
15	K713	Strengthener Screw
16	K4327	Lift Pin
17	K3373	Cartridge, Shure P-81
18	K4072	Hinge Assembly
19	K2904	Cartridge Mounting Screw
20	K3673-G	Reject Knob
21	K1651	"C" Washer-Switch Control
22	K4236-G	Speed Control Knob
23	K2594	"C" Washer-Switch Control
24	K2957	12" Record Selector
25	K3563-A	Turntable
26	K3677	Spindle & Bearing Assembly - Consists of:
		3683 Spindle Assembly less Ball Race & Washers
27		K1569 Bearing (Ball Race)
28		K2639 Bearing Washers
29		K1529 Record Pusher
30		K4608 Spindle Body & Base Assembly
31		K1527 Pusher Spring
32		K2552 Pusher Shaft Spring
33		K2539 Pusher Shaft & Housing Assembly
34	K4644	Screw, #10-24 x 5/8
35	K4243-U	Plastic Base
36	K4239	Motor Speed Control Rod
37	K2909	Washer
38	K4241	Control Shaft Assy.-Motor
39	K2765	Rubber Grommet
40	K2546	Record Support Holddown Spring
41	K4250	Switch Control Lever Assy.
42	K2110	"C" Washer
43	K4237	Shut-Off Rod
44	K2952	Fibre Washer
45	K2580	Rubber Bumper
46	K1652	"C" Washer

PARTS LIST - Con't.

Ref. No.	Part No.	Description		Ref. No.	Part No.	Description	
47	K1588	"C" Washer		79	K4331	Trip Finger Cam & Shaft Assembly	
48	K1720	Speed Nut					
49	K4172	Compression Spring for Item 24		80	K2953	Spring Washer	
				81	K3962	Conical Lift Pin Spring	
50	K2563	Spring-12" Record Selector		82	K1588	"C" Washer	
51	K1719	"C" Washer-Main Gear Assembly		83	K5418	Main Gear Assembly	
				84		K1588 "C" Washer	
52	K4416	Shut-off Bracket Assembly		85		K4172 Spring	
53	K4856	Screw, 6-32 x 5/16 Hex. Hd.		86		K5339 Pawl Lever	
54	K4330	Die-Cast Frame		87		K5338 Pawl Spring	
55	K101	Screw, 10-24 x 3/8 Sems B.H.		88		K2569 Trip Lever Assy.	
56	K3901	Reject Spring		89	K1588	"C" Washer	
57	K467	Switch		90	K4656	Trip Link	
58	K4938	Return Spring-Pickup Arm		91	K4706	Slide Support	
59	K2931	Fibre Strip (Switch insulating)		92	K2211	Slide Bearing	
				92A	K4856	Screw, 6-32 x 5/16 Hex. Hd.	
60	K4950	Fibre Washer		93	K2246	Spring-Slide Bearing	
61	K2573	Switch Cover		94	K2951	Terminal Strip	
62	K4212	Retainer (switch cover)		95	K2932	Screw, 4-40 Hex. Hd.	
63	K2284	Control Shaft Assembly		96	K4014	Slide & Cam Assembly	
64	K2208	Pal-Nut 1/2-20		97	K4005	Escape Lever	
65	K2579	Spring-7" Set-Down Lever		98	K2585	Escape Lever Spring	
66	K2581	7" Set-Down Lever		99	K2274	Washer-Slide Bearing	
67	K492	Washer, Flat Steel		100	K4856	Screw, 6-32 x 1/4	
68	K4856	Screw		101	K101	Screw, 10-24 x 3/8 Sems B.H.	
69	K2925	Spring-Reset Lever					
70	K2560	Reset Lever		102	K2571	Ejector Link Assembly	
71	K492	Washer, Flat Steel		103	K5690	Motor	
72	K4856	Screw, 6-32 x 1/4				K5002 Idler Wheel	
73	K2579	Spring-Shut-Off Lever				K3452 Idler Arm Tension Spring	
74	K4013	Lever Assembly Shut-Off				K6175 Idler Wheel Arm Assembly	
75	K4947	Lever Assembly Bearing				K3139 Pulley, 78RPM	
76	K2932	Screw, 4-40 x 1/4 Hex. Hd.				K3140 Pulley, 45RPM	
77	K2561	Locator Plate-Tone Arm Return				K3141 Pulley, 33 1/3RPM	
78	K2271	Retaining Ring-Locator Plate					

PROPERTY OF
L. F. BLANKENSHIP
DENVER, COLORADO

STEELMAN
MODEL 3AR3

STEELMAN
MODEL 3AR3

TRADE NAME	Steelman Model 3AR3
MANUFACTURER	Steelman Radio & Phono Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver with 3 Speed Automatic Record Changer
TUBES (Six)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 12AX7 AF Amp.-Phase Inv., (2) 35L6GT Audio Output
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .34 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set the "Radio Phono" switch to "Radio" position.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT- SEE V-M MODEL 950-PHOTOFACT SET 107-FOLDER 13
. OR RECORD CHANGER MANUAL CM-3.

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PARTS LIST AND DESCRIPTIONS

STEELMAN MODEL 3AR3

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC	12AT6	12AT6	7BT	
V4	AF Amp. -Phase Inv.	12AX7	12AX7	9A	
V5	Audio Output	35L6GT	35L6GT	7S	
V6	Audio Output	35L6GT	35L6GT	7S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	C-EC-842	PRS150/80-40-20		BBRD8415		3N538	TVA-3455	Yellow
B	80	150				BBR20-150				Red
C	20	150								Blue
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C4A	100			♦PA-47	♦PC-50	♦111TM1	♦1403-01	UC-531	♦100C1	
B	100							UC-531		
C5	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C6	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C7	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C8	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C9	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C10	100			S1100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C11	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C12	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C13	.05	400		489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C14	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C15	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	

♦ Items C4A, C4B and R8 are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	3 Meg	1/2	VC-1					Volume tapped at 260K
R2A	100KΩ	1/2	VC-3	Q11-128	A47-100K-S	AB-40	U-41	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R2A

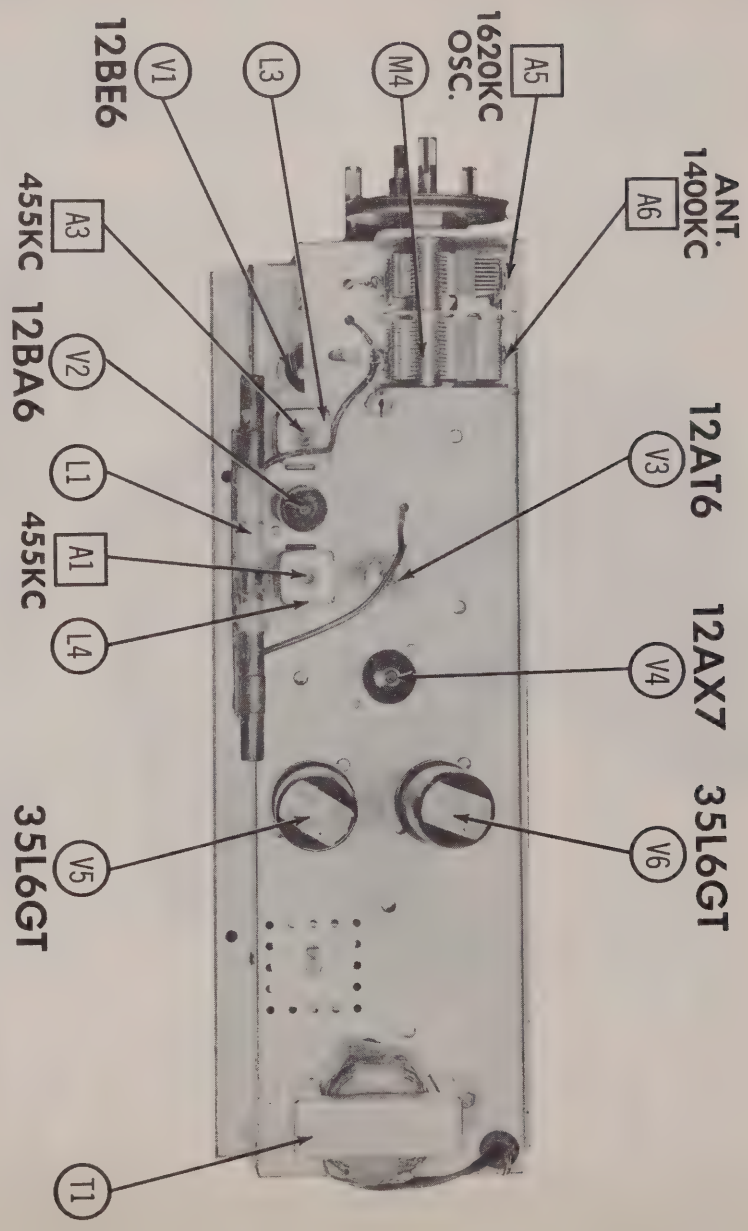
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	NOTES
R3	470KΩ	1/2		BTS-470K	
R4	22KΩ	1/2		BTS-22K	
R5	220Ω	1/2		BTS-220	
R6	2 Meg	1/2		BTS-2 Meg	
R7	220KΩ	1/2		BTS-220K	
R8	47KΩ	1/2	♦	BTS-47K	
R9	47KΩ	1/2		BTS-47K	
R10	10 Meg	1/2		BTS-10 Meg	
R11	18KΩ	1/2		BTS-18K	
R12	4700Ω	1/2		BTS-4700	
R13	220KΩ	1/2		BTS-220K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	NOTES
R14	10KΩ	1/2		BTS-10K	
R15	220KΩ	1/2		BTS-220K	
R16	470KΩ	1/2		BTS-470K	
R17	47KΩ	1-1/2		BTS-47K	
R18	75Ω	2			
R19	470KΩ	1/2		BTS-470K	
R20	2200Ω	1		BTA-2200	
R21	100Ω	2			
R22	22Ω	2			
R23	2.2 Meg	1/2		BTS-2.2Meg	

♦ Items R8, C4A, C4B are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: STEELMAN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	5KΩCT	1.8Ω tapped							Feed back winding tapped ⓐ .89Ω DC

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.6Ω		ST-108 Mod P6-X	6A1	Speakers used in parallel
SP2	6"	PM	3.6Ω		ST-108 Mod P6-X	6A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: STEELMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	.4Ω		LPFE-14				
L2	Osc. Coil	.6Ω	5.5Ω		14-1073		69-Osc.	
L3	Input IF	25Ω	25Ω	LF-50	16-6758	BC-352	12-C1	
L4	Output IF	25Ω	25Ω	LF-50	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA: STEELMAN PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	NOTES
M1	.108A		5 P1	1005A	6S150	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2						43	0-2 or S-2	

ELECTRO-VOICE NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M3		†W-75TPS	†AC-434 ♦†AC-434D1 ♦†AC-434D2 ♦ AC-434D	†S-66	† Jewel ♦ Diamond

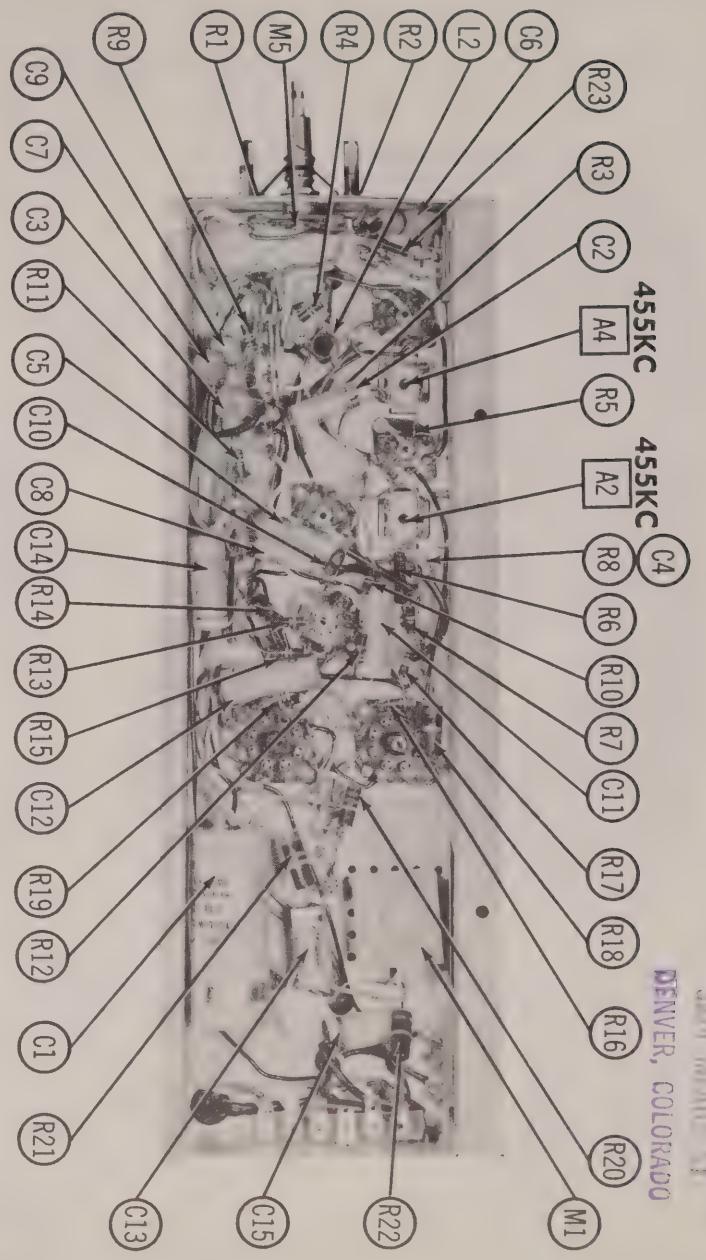
SET 243

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M4	Tuning cap	CV-52	(47-472MMF)(29-195MMF)
M5	Switch		Radio - phone

FOLDER 10

CHASSIS—BOTTOM VIEW



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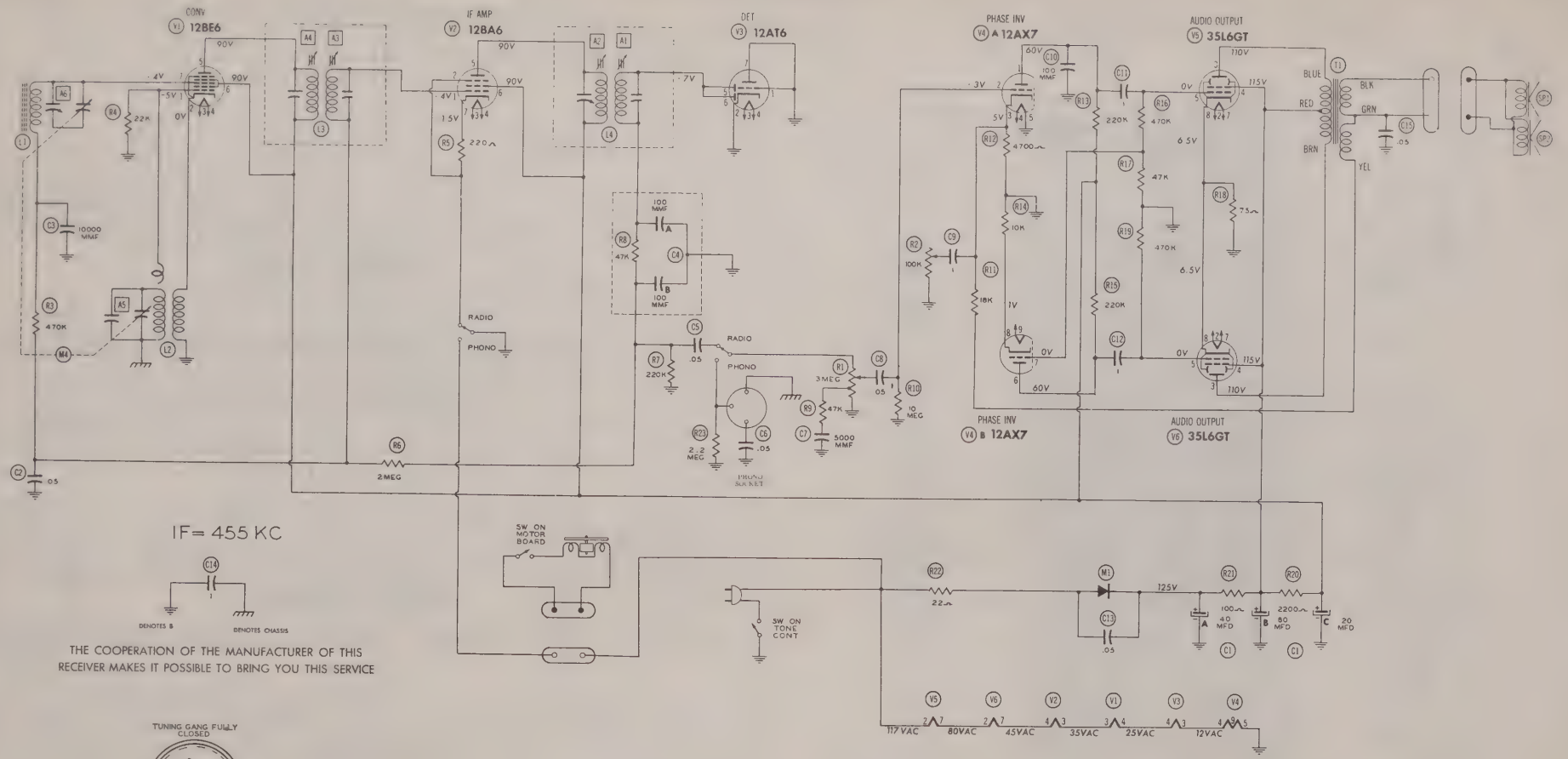
STEELMAN MODEL 3AR3



IF= 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12BE6	22KΩ	.8Ω	50Ω	33Ω	†2.3 KΩ	†2.3KΩ	2.7Meg		
V 2	12BA6	2.2Meg	0Ω	50Ω	66Ω	†2.3KΩ	†2.3KΩ	220Ω		
V 3	12AT6	0Ω	0Ω	15Ω	33Ω	270KΩ	270KΩ	0Ω		
V 4	12AX7	†220KΩ	10Meg	4.7KΩ	15Ω	0Ω	†220KΩ	47KΩ	10KΩ	8Ω
V 5	35L6GT	INF	155Ω	†300Ω	†100Ω	520KΩ	0Ω	110Ω	75Ω	
V 6	35L6GT	INF	110Ω	†300Ω	†100Ω	470KΩ	47KΩ	66Ω	75Ω	

† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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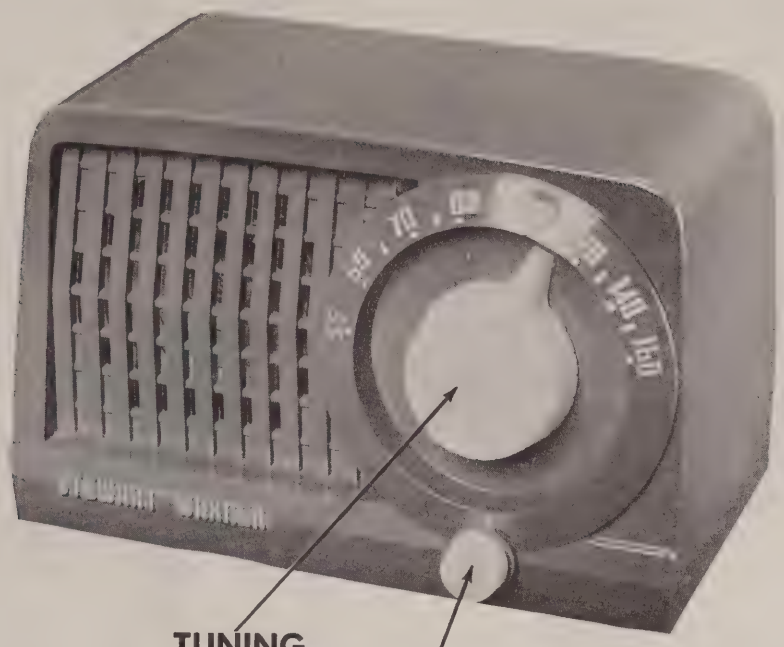
STEWART-WARNER
MODELS 9180B, H



PROPERTY OF
L. F. ONKENSHIP
3008 NEVADA ST.
DENVER, COLORADO

STEWART-WARNER
MODELS 9180B, H

TRADE NAME	Stewart-Warner Model 9180B, H
MANUFACTURER	Stewart-Warner Electric, Div. of Stewart-Warner Corp., 1300 N. Koster Ave., Chicago 15, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Four)	Types 12BE6 Conv., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to antenna stator lug. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output.
2.	"	High side to external antenna lead. Low side to B-.	1650KC	"	"	A3	"
3.	"	"	1400KC	"	"	A4	"
4.	"	"	600KC	Tune to 600KC signal	"	A5	Adjust for maximum deflection while rocking tuning gang thru 600KC signal. Repeat steps 2, 3 and 4.

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PARTS LIST AND DESCRIPTIONS

STEWART-WARNER MODEL 9180B

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Stewart Warner PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	Det-AVC-AF-Amp.	12AT6	12AT6	7BT	
V3	Audio-Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Stewart-Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	509837	PRS150/50-30		BBRD-5315		TCD-497	TVA-2450	Red Blue
B	30	150								
C2	.05	400	512028	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	5		513432	SI5NP0	TCZ-4.7	TZ07	NP0K-5	ZT-555	5TCUB-V5	
C4	33		513028	SI33	D6-330	TZ18	GP1K-330	UC-5333	5GA-Q33	
C5A	220									
B	2000									
C	250		♦509836	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦103C4	
D										
E	5000									
C6	.02	400	512017	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C7	.05	400	512028	489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C8	.05	400	512028	489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	

♦ Items C5A, C5B, C5C, C5D, C5E, R4A, R4B and R4C are combined in one unit.
Items C5C and C5D should total 250MMF when replacing items separately.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stewart Warner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	509830	Q13-137	A47-1Meg-S	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stewart-Warner PART No.	IRC PART No.	
R2	22KΩ	½	510161	BTS-22K	
R3	2.2Meg	½	510193	BTS-2.2Meg	
R4A	6.8Meg	½	♦ 509836	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	

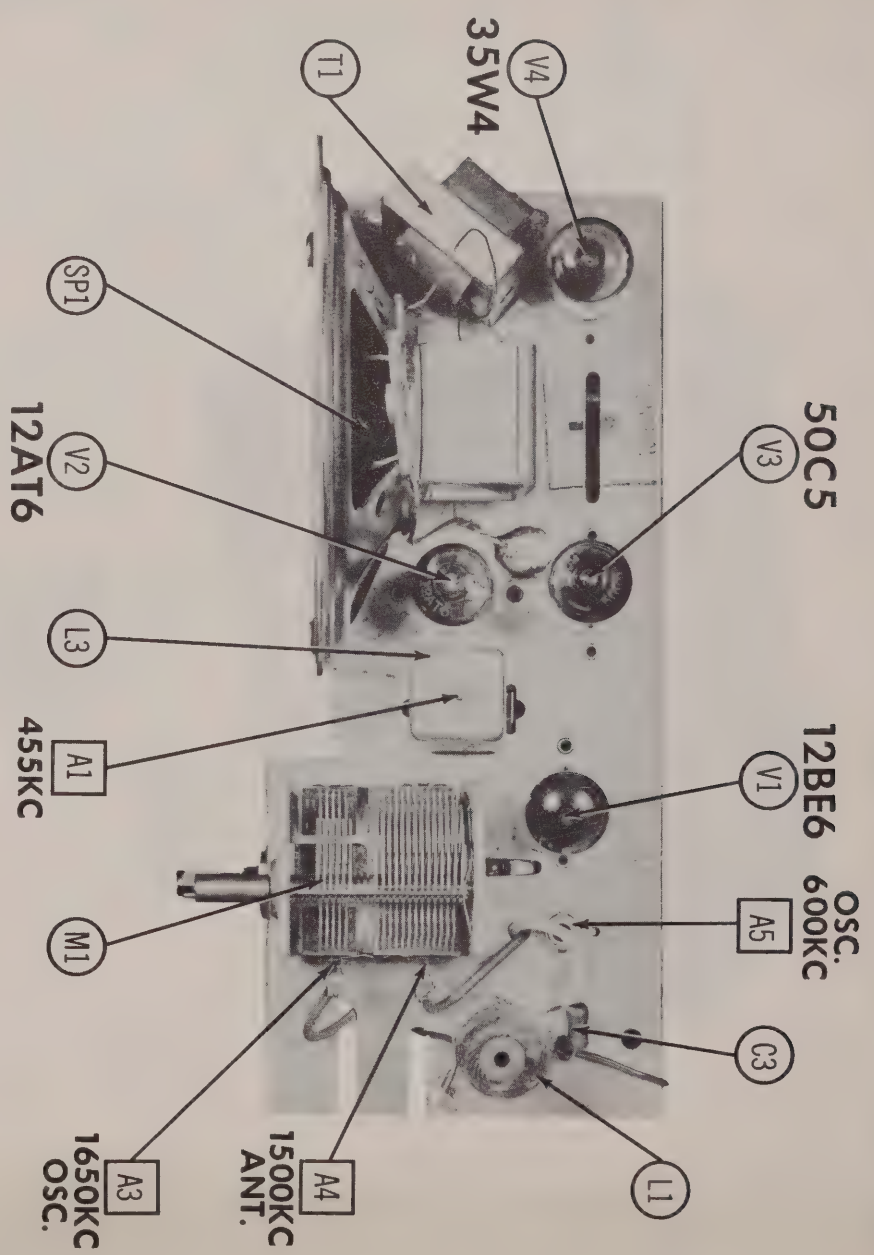
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stewart-Warner PART No.	IRC PART No.	
R5	150Ω	½	510122	BTS-150	
R6	2200Ω	½	510143	BTS-2200	
R7	68Ω	2	510616		

♦ Items R4A, R4B, R4C, C5A, C5B, C5C, C5D, C5E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Stewart Warner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.5KΩ	3.9Ω	509826	A-3332①	A-3025 ①	S-1X ①	Z1101 ①	TS-24S50 ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Stewart Warner PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.9Ω	C-509828	ST-113 Mod P4-X	4A07	

COILS (RF-IF)

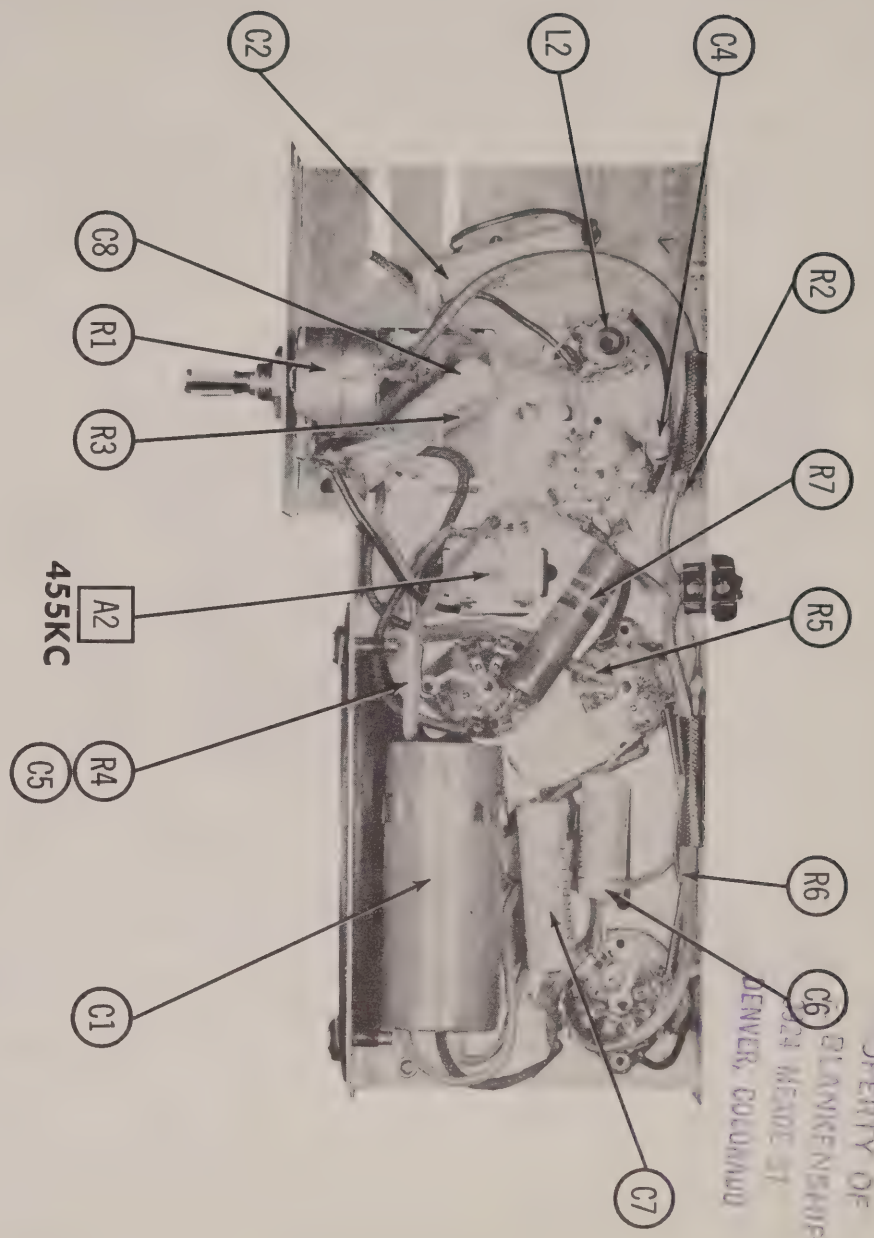
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Stewart Warner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	44Ω	2.8Ω	521556	14-1056	BC-380	A-5495-A	
L2	Osc. Coil	.6Ω	8.5Ω	521550	14-1074		70-Osc.	
L3	IF Trans.	20Ω	22Ω	521561	16-6758 *	BC-353 *	12-C2 *	Prl. tapped @ .8Ω

* Connect B+ line to pin 6 of V1.

MISCELLANEOUS

ITEM No.	PART NAME	Stewart Warner PART No.	NOTES
M1	Tuner	509827	(31-390MMF) (10-100MMF)
	Cabinet	521570-B	Green model 9180-B
	Cabinet	521570-H	Black model 9180-H
	Knob	509839-A	Tan pointer model 9180-B
	Knob	509839-F	Red pointer model 9180-H
	Knob	509841-A	Tan volume model 9180-B
	Knob	509841-F	Red volume model 9180-H

CHASSIS—BOTTOM VIEW



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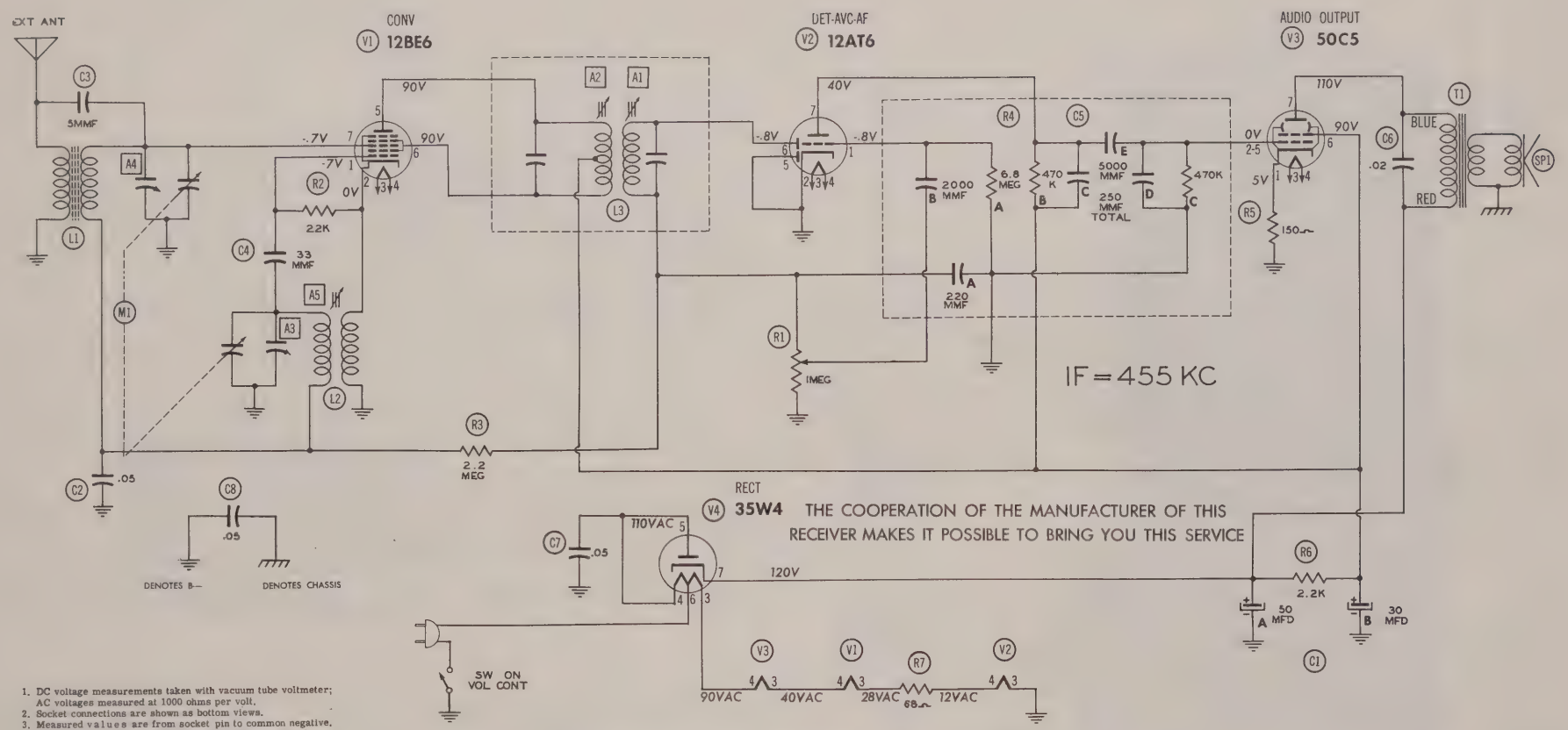
STEWART-WARNER MODEL 9180B



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.6Ω	80Ω	92Ω	†2.2KΩ	†2.2KΩ	3.2Meg
V 2	12AT6	6.8Meg	0Ω	0Ω	12Ω	0Ω	1Meg	†470KΩ
V 3	50C5	150Ω	470KΩ	92Ω	145Ω	470KΩ	†2.2KΩ	†190Ω
V 4	35W4	†0Ω	†0Ω	145Ω	180Ω	180Ω	170Ω	150KΩ

† MEASURED FROM PIN 7 OF V4

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TRAVLER MODEL 5310

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRAVLER MODEL 5310

TRAVLER MODEL 5310

TRADE NAME	Travler Model 5310
MANUFACTURER	Travler Radio & Tel. Corp., 571 W. Jackson Blvd., Chicago, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver With 3 Speed Automatic Record Changer
TUBES (Five)	Types 12SA7 Conv., 12SK7 IF Amp., 12SQ7 Det.-AVC-AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .32 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1720KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove chassis from cabinet and connect 20KΩ resistor across loop connector terminals.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Turn tone control fully counter clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1720KC	"	"	A5	Adjust for maximum output. Remove 20KΩ resistor and install chassis in cabinet.
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT- SEE CRESENT 500 SERIES - PHOTOFACT SET 197 - FOLDER 4.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TRAVLER MODEL 5310

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		TRAVLER PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7	12SA7	8R	
V2	IF Amplifier	12SK7	12SK7	8N	
V3	Det-AVC-AF Amp.	12SQ7	12SQ7	8Q	
V4	Audio Output	50L6GT	50L6GT	7S	
V5	Rectifier	35Z5	35Z5	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRAVLER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150	EC-14	PRS150/50-30-20		BBRT44215		3N532	TVA-3448	Red
B	40	150								Blue
C	20	150								Yellow
C2	.05	400	PC-5	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	50	500	MC-4	1468-00005		22R5Q1		MCB225	MS-45	
C4	.25	200	PC-4	P288-25		PJ2P25		PT4025	2TM-P25	
C5	.05	400	PC-5	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	100	500	MC-2	1468-0001		5R5T1		MCB235	MS-31	
C7	500	500	MC-5	1468-0005		5R5T5		MCB245	MS-35	
C8	.005	600	PC-6	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C9	500	500	MC-5	1468-0005		5R5T5		MCB245	MS-35	
C10	.005	600	MC-5	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C11	.01	400	PC-7	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C12	.05	400	PC-5	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C13	.05	400	PC-5	489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C14	.1	400	PC-8	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C15	.05	400	PC-5	P488-05	DF-503	CUB4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRAVLER PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	VC-4	Q13-137	A47-1Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRAVLER PART No.	IRC PART No.	
R2	220KΩ	½	IR-20	BTS-220K	
R3	2.2KΩ	½	IR-9	BTS-22K	
R4	39KΩ	½		BTS-39K	Note 1
R5	3.3 Meg	½	IR-23	BTS-3.3Meg	
R6	330Ω	½	IR-21	BTS-330	
R7	39KΩ	½		BTS-39K	Note 1
R8	2.2Meg	½	IR-13	BTS-2.2Meg	
R9	470KΩ	½	IR-11	BTS-470K	

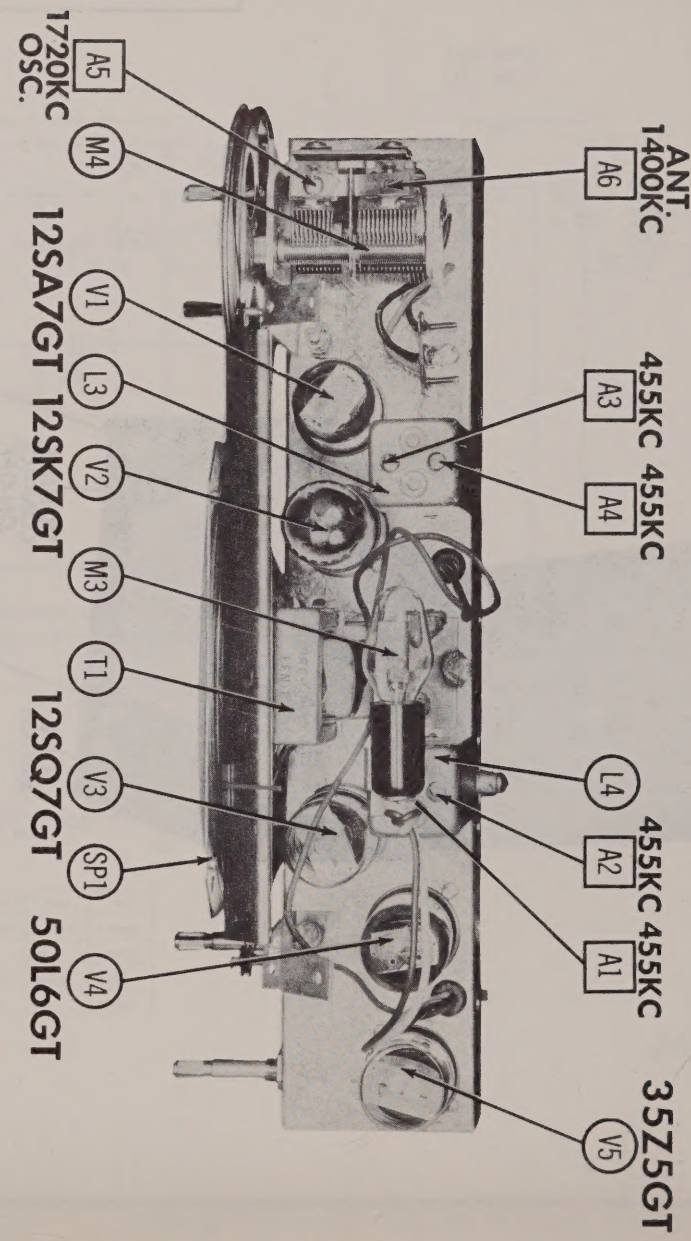
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRAVLER PART No.	IRC PART No.	
R10	470KΩ	½	IR-11	BTS-470K	
R11	2200Ω	½	IR-15	BTS-2200	
R12	470Ω	½	IR-1	BTS-470	
R13	1000Ω	1	IR-42	BTA-1000	
R14	33Ω	½	IR-17	BTS-33	
R15	33Ω	½	IR-17	BTS-33	
R16	470KΩ	½	IR-11	BTS-470K	Note 2
R17	470KΩ	½	IR-11	BTS-470K	

Note 1. Some models may use a 47KΩ resistor in this application.
Note 2. Not used in all models.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRAVLER PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3Ω	Part of SPK-17	A-3336 ①	A-3031 ①		Z1102	TS-24S50A ①	① Bend mounting tabs down file out slots, Mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRAVLER PART No.	VIKING PART No.	QUAM PART No.	
SP1A	4"X 6"	PM	3Ω	SPK-17	46J6	46A1	
B	5"	PM	3Ω	SPK-12	5J4	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRAVLER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3Ω		LL-17				
L2	Osc. Coil	.8Ω	7.5Ω	LO-14	14-1074	BC-397 †	70-Osc.	
L3	Input IF	19Ω	19Ω	LI-6	16-6666	BC-368	112-C1	
L4	Output IF	18Ω	18Ω	LI-7	16-6667	BC-371	112-C4	

† Drill mounting hole.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	TRAVLER PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A-1 or A-3	W22AB-T	A65MG A62A	46-T	0-1 or S-1 & 0-3 or S-3	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

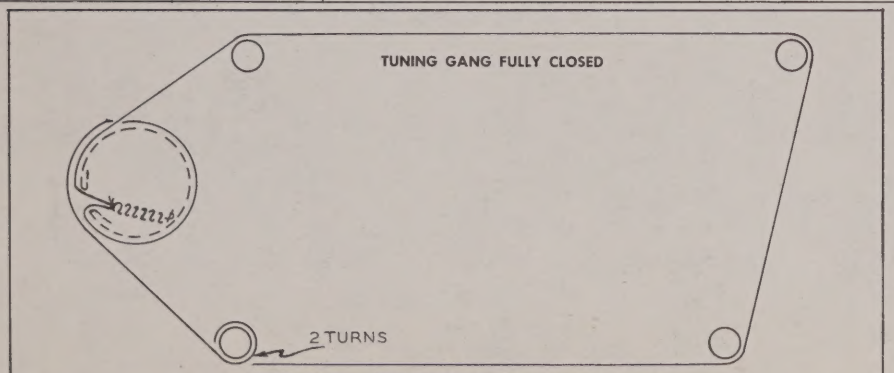
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	TRAVLER PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		W-30A & W-30MGS	JP-30 or JPS-30 & JPS-30LP or JP-30LP		

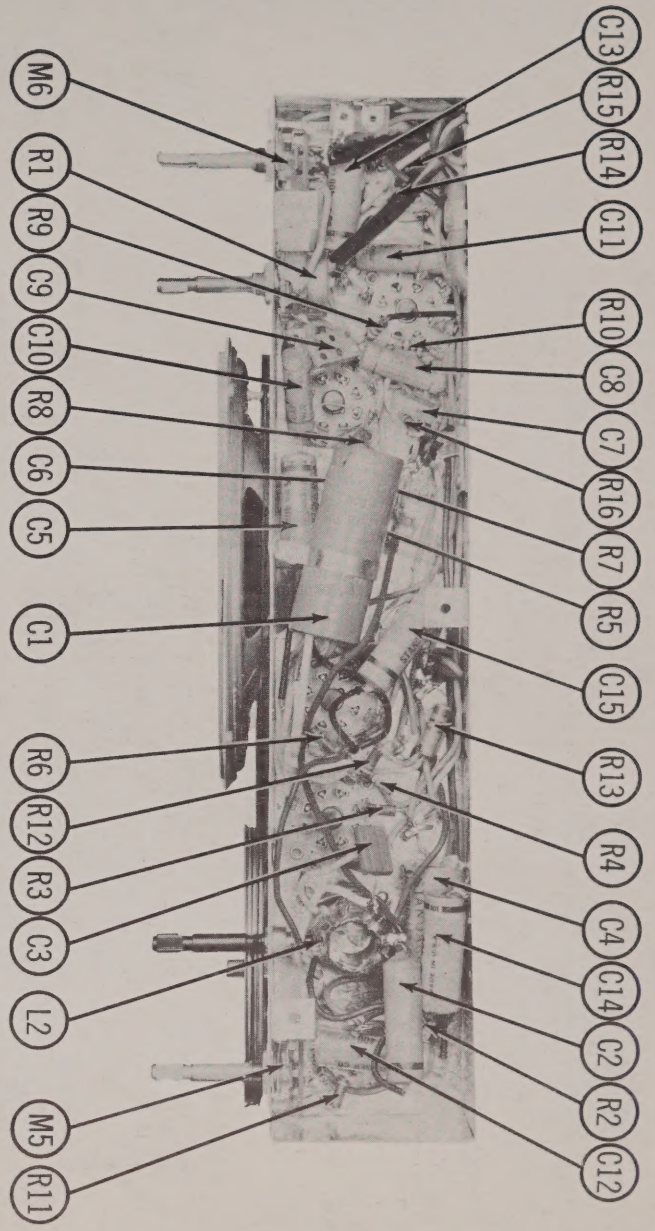
MISCELLANEOUS

ITEM No.	PART NAME	TRAVLER PART No.	NOTES
M3	Dial light	PB-2	115-125V-7W (screw base)
M4	Tuner		
M5	Switch	SW-2	Tone
M6	Switch	SW-1	Radio-phono select



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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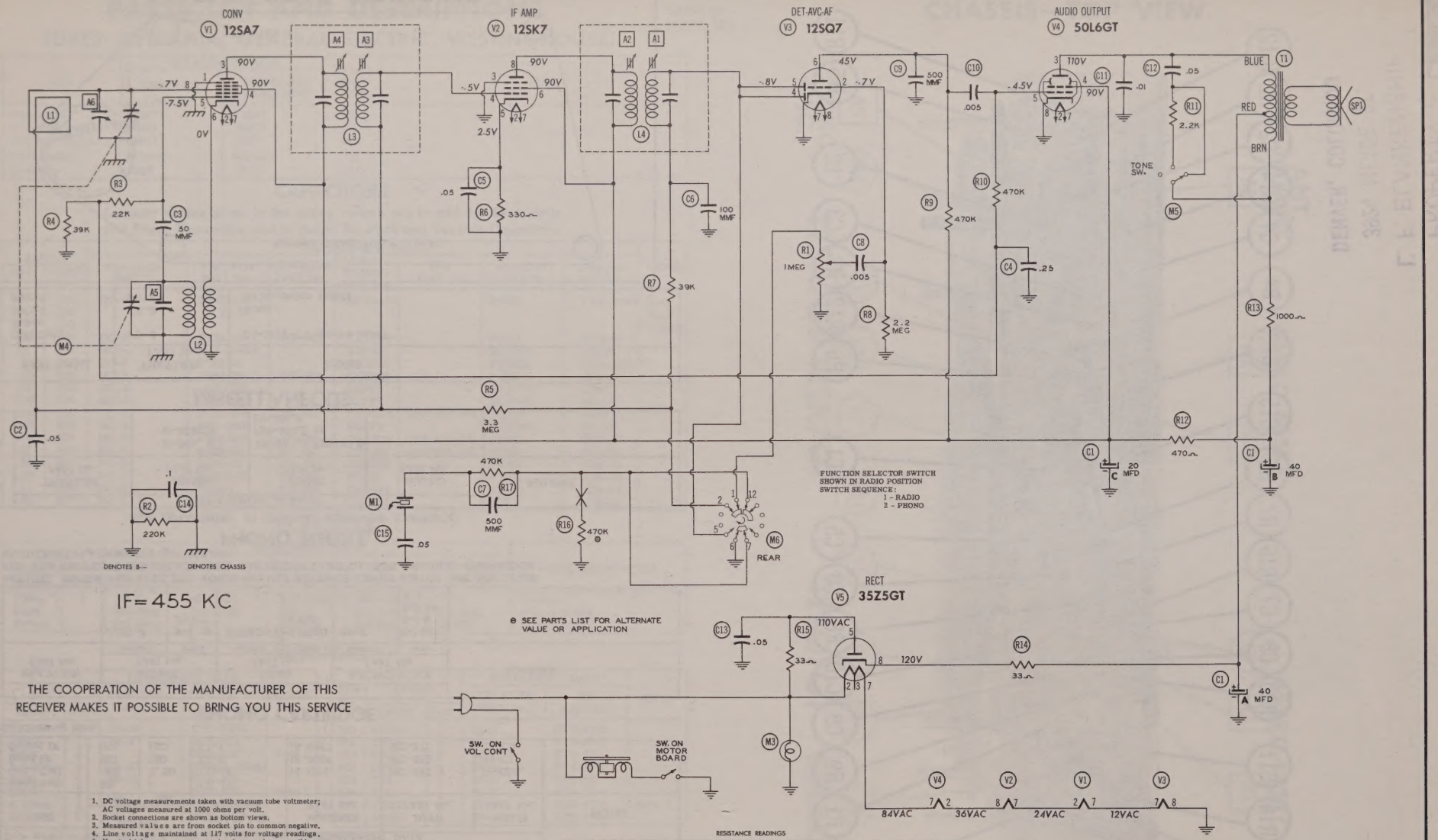

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	220KΩ	25Ω	†1.5KΩ	†1.5KΩ	60KΩ	.8Ω	14Ω	4.3Meg
V 2	12SK7	220KΩ	35Ω	0Ω	4.3Meg	330Ω	†1.5KΩ	25Ω	†1.5KΩ
V 3	12SQ7	220KΩ	2.2Meg	0Ω	1Meg	1Meg	†470KΩ	14Ω	0Ω
V 4	50L6	220KΩ	35Ω	†230Ω	†1.5KΩ	520KΩ	47KΩ	70Ω	0Ω
V 5	35Z5	INF	85Ω	80Ω	INF	118Ω	†33Ω	70Ω	150KΩ

† MEASURED FROM PIN 8 OF V5

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